TECHNOLOGY DEPT.

JULY, 1943

Industrial FINISHING

Published Monthly in the Interest of Modern Production Finishing

JUL 22 1943
DETROIT

A Symbol of Faith, and Hope

That's what this flag is . . . what it has been and what it will continue to be, with God's help and the sweat and toil of 135,000,000 Americans, to say nothing of untold millions who, in spite of the crushing heel of tyrants, still look upon it as the Wise Men did upon the Star of Bethlehem, centuries ago. We of the Lilly Varnish Company are proud to participate again in the national crusade to display the Stars and Stripes on the front covers of all magazines during July, the anniversary month of our independence.

LILLY VARNISH COMPANY
Indianapolis, Indiana
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One-half of the unit shown is finished with Standard Rincontrol while the other half of the unit is finished with the new Rincontrol using less critical oils.

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WRINKLE finish users who have standardized on Rincontrol, are able today to obtain the same dependable results in production with this material, even though the use of hard-drying oils has been discontinued by Government order.

It has never been any particular problem to produce wrinkles from domestic oils, but such materials are apt to be objectionably glossy, coarse, non-uniform in structure, and excessively slow drying.

Before releasing the less critical type of Rincontrol, our laboratories have conclusively proved it to be comparable with our standards in appearance as well as in uniformity of pattern, toughness, and abrasion resistance when properly baked.

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Box 173

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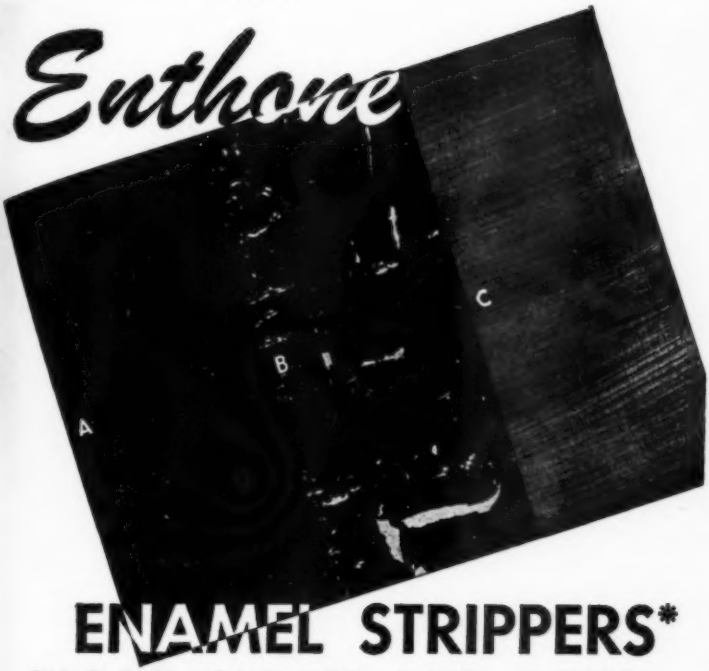
TECHNOLOGY DEPT.

Enthone



ENAMEL STRIPPERS*
WORK CLEAN AND FAST

The above panel shows how fast Enthone Enamel Strippers go to work.

Panel *"A"—Original enamel of urea-formaldehyde type*
Panel *"B"—After one minute in stripper*
Panel *"C"—After two minutes in stripper*

Notice that the enamel lifts away from the surface, leaving it clean and unattacked.

Enthone Enamel Strippers do not attack any base metal or anodized coatings.

Consult Enthone for stripping synthetics, japans, lacquers.

THE ENTHONE CO NEW HAVEN CONNECTICUT

REPRESENTATIVES IN PRINCIPAL CITIES

*Protected by U. S. Patent No. 2242106

Synergism HELPS WIN AN IMPORTANT MILITARY OBJECTIVE

SYNERGISM—meaning forces working together to produce results far greater than both working separately might achieve—has helped win an important military objective. This is the finish so important to the new steel cartridge cases, replacing critical brass.

Leading metals manufacturers were given the job of producing steel cartridge cases which involve a whole new set of manufacturing problems, from drawing the case to finishing it. They called in Zapon, who knew little of cartridge case fabrication from steel, but has a broad background of metal finishing.

Zapon technicians and the manufacturer's men sat down together and studied the problem. The finish must protect inside and outside, against the charge, abrasion, weather all over the world, and other factors. A finishing procedure to fit into the production line was needed.

Formulas were studied. Constant discussions were held. The result was a Zapon steel cartridge case finish exceeding in several respects the Army's rigid requirements. Likewise it was fitted to fast manufacturing methods. Today carload after carload of Zapon finished cases moves to the fronts.

Thus did synergism help solve an important problem and solve it fast because it went far beyond mere co-operation. Our men became partners with the manufacturer's men and each gave the other ideas that might not have been born through co-operation only. Thus does synergism crack new industrial frontiers. Let's talk it over.

ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. *Western Sales:* North Chicago, Ill.

INDUSTRIAL FINISHES

NINETEENTH YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XIX, No. 9 JULY, 1943 $2.00 a Year

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Letters from Readers

Fluorescent Paint

We are interested in securing a fluorescent material to be used on plastics, so that when in contact with the black light it will give off an orange-red glow. We wonder if in your file of business houses, who furnish material of this kind, you might have two or three names which you might be in a position to give us? Any information you can give us regarding this material will be greatly appreciated.—E. F. Co.

Information supplied.—ED.

Electrical Paint

Can you tell me where I can obtain electrical conducting paint?—D. Insulation Co.

Names of manufacturers of metallic paints have been submitted by letter. —ED.

Finishes for Fabrics

On page 96 of Dec. 1942 issue of this magazine, I notice a paragraph about organic finishes for decorating fabrics, curtains, etc. Can you tell me who could supply such a material as this?—C. P. J.

In a letter we are submitting the names and addresses of several concerns (advertisers in I. F.) who can supply what you want.—ED.

London Gets I. F. Regularly

You will be interested to hear that during the past three war years we have been receiving our monthly copy of INDUSTRIAL FINISHING without a break. We regret to say, however, that

PLANNING OUR FUTURES

WHEN THE lights go on again and our victorious boys come home, they will want jobs with a future—NOT RELIEF.

It is up to us to keep our Industries going and to plan now for future operations.

While serving our Government with total productive capacity, we are exerting every effort to develop products which may well lead the post war parade in Protective Coatings and Industrial Finishes.

Our research laboratories have already developed numerous products which may be applicable to your future plans. *You need only write, indicating your interest, to obtain information and service.*

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I. C. D. FORMULA NINE

NON-INFLAMMABLE « *wax free* REMOVER »

for paint, varnish, lacquer, baked enamel, adhesives

EASY TO APPLY—NO AFTER-CLEANING

ORDER TRIAL GALLON AT DRUM PRICE

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SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

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Made from Non-Critical Oils

The use of Oiticica and China wood oils in wrinkle finishes has been prohibited due to a critical shortage.

United's Technical Staff has met this challenge by developing a new wrinkle which is formulated from non-critical oils. It has the characteristics of our standard wrinkle regarding appearance, uniformity, application, and baking schedule, etc. It is available in various colors and shades.

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New England Mfg. Div.; Boston, Mass.
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Start planning now for new flock finishes on your Fall novelty items in appropriate colors. Give them eye appeal that "sells", with

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FLOCKS

EASILY APPLIED AT LOW COST

SAMPLES AND COLOR CARD ON REQUEST

CLAREMONT WASTE MFG. COMPANY

CLAREMONT, N. H.

The country's largest mfrs. of Cotton, Wool and Rayon Flocks

we have missed the February 1943 issue, and we would be pleased if you would forward an extra copy to us if this is possible.

Owing to the fact that we have these copies bound at the end of each year, we naturally do not want to be short of the copy in question.—Oxvar Limited, London, England.

For Tilting Large Containers

On page 56 of your April issue, you had an article in regard to tilting 50-gallon drums of paint. I would appreciate your advising me what firm fabricates these devices, as we could use these in our plant. Your prompt reply will be appreciated.—F. E. Inc. (Refrigerators).

Information supplied.—Ed.

Will Finish Bottle Caps

We note in your June issue, that S. Beverage Co. (pages 7 and 8) would like to know how to apply paint on reclaimed bottle crowns. After they have stripped the old crowns and restamped same, they can send them to us and we will enamel them. We are doing thousands of gross every week and our facilities are still not up to capacity. If they are interested, we will gladly submit samples and quote prices.—Novelty Imperial Japanning Co., Chicago, Ill.

Water-Resistant Sealer

We are interested in a hot-water resistant sealer that can be applied to tile or cement floors in damp defrigerated rooms. Please furnish the names and addresses of manufacturers of such a product.—K. I. Co.

Screen Stenciling Machine

In the March 1943 issue of Industrial Finishing, on page 26, you give some interesting information about "Screen Stenciling." You mention, on page 30, that the rate of production varies anywhere from 200 to 2,000 impressions per hour. The former, we assume, refers to a hand stenciling, while the latter is probably done on a specially designed machine, of which you say there are various types on the market.

We would be interested in having more detailed information about the manufacturers of these machines, realizing of course, that probably they are not now available.

We are manufacturers of a very large volume of cosmetic containers and other items and there is a par-

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USE

RONCOLAC CLEAR R-637

A Shellac Replacement— not a substitute

Roncolac R-637 is extremely tough —more durable than shellac. It dries equally fast, is waterproof, has excellent adhesion, handles in every respect as easily as shellac. Roncolac Clear R-637 is not a hastily developed "war-baby." Because of its general all-around properties, many of which outperform Shellac, it will have a permanent place in the finishing field after the war. Order a trial lot. You'll want more!

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Paints — Varnishes — Lacquers

BEAUTIFUL
Velvet
AND
Suede
EFFECTS
WITH
Cellusuede
FLOCK

Easily applied to cloth, paper, metal or wood with a spray gun or by sifting. Rayon and Cotton Flocks supplied in one pound bags, twelve to a case, solid or assorted colors. Also supplied in 10 and 50 pound bags. Wide variety of standard colors. Special colors, if desired, in lots of 100 pounds or over. Many distinctive color effects produced by varying shade of adhesive and flock. Write for Color Card, samples, detailed information.

CP
Cellusuede Products, Inc.
ROCKFORD, ILLINOIS

ticular demand for new finishes and decorations. We are interested in anything of that nature, particularly for post-war production.—V. Mfg. Co.

We are referring your letter to the author of the article, Mr. Bert Zahn. —ED.

Payne's Article Wanted

We are interested in obtaining a reprint or tear sheets of the article by H. F. Payne, entitled "Uniform Film Thickness on Dip-Coated Products," which appeared in the May 1943 issue of this magazine (pages 26, 28, 30, 32.)—Interchemical Corp.

Tear sheets are being sent.—ED.

Salvaging From Paint Sludge

Please send me your information on how to salvage resins plasticizer from paint sludge.—A. P. Co. (Aircraft).

We believe that this can best be done by your supplier of paint materials. Articles on this subject have appeared in past issues of INDUSTRIAL FINISHING Magazine, most of them having been written by Mr. John J. Zolad, who is with Industrial Coating Engineers, Detroit, Mich. Mr. Zefferino Mezzetti of Muskegon, Mich., reports that he has developed and is using something suitable for salvaging material from paint sludge.—ED.

Tinted Baked Coating for Steel

A large manufacturing concern in the middle west is eager to get a clear coating to be applied on steel, and which can be tinted so that the steel looks like aluminum, silver or gold.

Th's coating will be baked on and will be used in large quantities. If you can supply a coating that will fill the above specifications, or tell us where it can be obtained, it will be greatly appreciated.—N. R. B.

In a letter we are submitting names of a few firms who, we believe, can supply what your client desires.—ED.

Repairing Porcelain Enamel

In your May 1943 issue of INDUSTRIAL FINISHING, we note on page 4, a letter titled "Repairing Porcelain Enamel," where you had furnished information to a concern regarding the repairing of chipped porcelain enamel table tops.

We would appreciate your sending us this information too, as we have a similar problem. We are repairing our

(Continued on Page 80)

★

Lacquers

Fillers

Stains

Enamels

Paints

Strict regulations mean victory sooner . . . .

War requisitions have the right of way and high-priority contracts and sub-contracts requiring critical materials *go thru*. Civilian or semi-military business must take second place for the time being. But we have *new non-critical materials* worth thinking about. Better drop us a line.

★ *Use Stille-Young Finishes and "Finish with Confidence"*

THE STILLE-YOUNG CORPORATION

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CAMOUFLAGING combat planes is a delicate business. The paint must be dull, so no tell-tale flashes or gleams are reflected. But dull-finished enamels are usually rough-surfaced and thus they increase "skin friction", reduce speed, waste power. So Arco has developed AIR-SLIP, an unprecedented *lusterless* enamel which meets the requirements for non-specular camouflage colors, yet provides most of the advantages of a highly polished surface.

Thus the Arco Research Laboratories meet specific needs with specialized products, tailored to fit . . . demonstrate once again their ability to find the solution to any problem paint can solve.

Paints for Industry THE ARCO CO.
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Turn Cleaning time into Production time..

Painting Parts for Cargo Planes in a Paasche Water Wash Booth, using Paasche Airpainting Equipment. These operators work in healthful, clean surroundings . . building the famous Curtis Skymaster at a plant somewhere in Kentucky.

with Paasche *Self-Cleaning* Water Wash Booths

Add production hours to your day without increasing working hours. Minimize the time-wasting, costly, messy job of spray-booth cleaning, by installing Paasche Self-Cleaning Water Wash Booths.

They employ a constant curtain of water and the action of powerful sprays to wash down the overspray that otherwise accumulates on walls of booth, air distributing plates, fans and exhaust ducts. In many cases the preciptated solids can be reclaimed, making a substantial saving! Paasche Water Wash Booths reduce fire hazards to a minimum; endorsed by safety engineers and industrial commissions. Available with water curtains either at back only; or at back and both sides, or at back, both sides and water wash at bottom. Engineered to your individual needs. Write for full information on Paasche Water Wash Booths and other Manual or Automatic Airpainting Equipment.

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Satisfactory Finishes

BY RUFUS J. FAIRBURN
Zapon Division, Atlas Powder Co.

CERTAIN U. S. AIR FORCES Specifications cover materials and schedules for finishing plywood parts for aircraft. In this article I will discuss finishes for all-wood construction.

If my approach to this subject varies in some respects to that of some other formulators and finishers, it is because all men do not think alike. Differences in background and experience account for variety in method.

Because one suggested material or schedule is different from another, it does not necessarily mean that one is right and the other wrong. One cannot say that one man is right because he drives a Buick, or that another man is right because he prefers a Chrysler. Each man prefers what his experience shows to be right for him.

Finishers of fabric and metal aircraft have encountered many of the problems that now confront finishers of wood aircraft. Other problems are more like those that have been encountered by wood finishers. While some of the old methods are applicable, an entirely new set of problems present themselves and call for new techniques.

Assembly lines of AT-10 twin-engine Beechcraft trainer planes made of plywood. Photograph, courtesy of Beech Aircraft Corp., Wichita, Kansas.

for Plywood Aircraft

Lumber from one species of tree differs from that of a different species. Trees of the same species may vary considerably from each other. The environment of each tree affects its characteristics. The soil, the climate and the season all play a part in forming the cellular structure of the tree.

Resin-Bonded Plywood

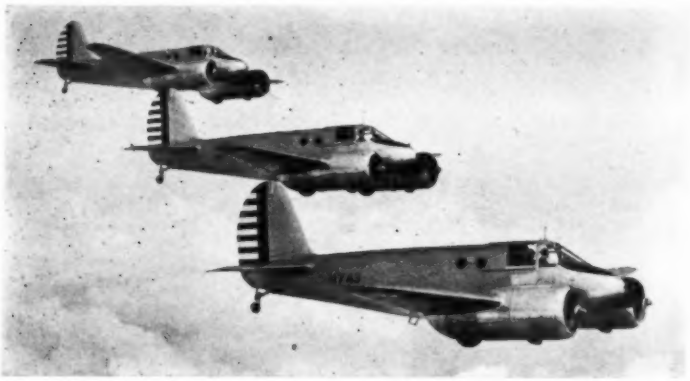
For most aircraft work, resin-bonded plywood is used. This is usually 3-ply construction in thicknesses of 1/32-in. up to about 1/4-in.; 5-plies or more are generally used in thicker construction. Perhaps the most commonly used woods at this time are mahogany, birch, spruce, gum, and fir. The wood may be moulded to form aircraft parts or it may be bent. The finishing procedure is about the same in either case.

It is important to have the wood properly smoothed in the millroom. Defects that may be permissible in furniture may cause trouble in aircraft work. The furniture finisher can build up his finish to hide such defects. For the aircraft finisher to attempt this might result in excess weight.

Three factors are of major importance when designing a finish for plywood aircraft:

DURABILITY — Resistance to entrance and exit of moisture; ability to withstand extremes of heat and cold; resistance to mechanical attack.

MINIMUM WEIGHT—Since weight affects speed and range of the craft, the finish must add as little



Formation flight, U. S. Army Air Forces; Beechcraft advanced trainers.

as possible to the total weight, with a minimum sacrifice of durability and smoothness.

SMOOTHNESS — Considerable thought is given to designing aircraft to minimize wind resistance. Naturally, the finish must be smooth enough to avoid hindering this effort. At the same time, weight must be considered. Some of these factors are at variance to each other.

The following schedules are suggested as a practical middle course. If, for instance, perfect smoothness may be sacrificed in the interest of better moisture resistance and less weight, Schedule II is preferable to Schedule I. Whatever change is attempted in these schedules will be at some sacrifice of one of the aforementioned major factors.

Schedule I—System of Finishing Plywood Aircraft

This is for maximum smoothness on mahogany and other open-grain woods.

1) SEALER—To comply with certain specifications this sealer must be applied with a non-volatile content of not less than 30%. The specification calls for at least two coats of this sealer on all exterior and interior surfaces.

The specification reads: "One inch by 3-in. strips of 3/32-in. birch plywood, specification AN-NN-R-511, finished with two dip coats of the sealer, shall have a water permeability of not more than 0.35 grams, and the finish shall not whiten during six hours immersion in distilled water."

The sealer that we prefer for this work contains the specified 30% non-volatiles. It is low in viscosity and, if given adequate time (four or five minutes), it will penetrate to the tiniest wood fibers. Thus applied, it far exceeds the above specification for water permeability. It is stable in an open dip tank. In such a tank there is of course some solvent loss through evaporation.

Application—The most satisfactory method of application is dipping. It may be applied "full weight." Work should be kept wet four or five minutes. After the

SAVE TIME LABOR AND MATERIAL WITH Sans-Arb

PHOTO LACQUER "WOOD AND MARBLE" VENEER

Any wood grain you desire . . . and marble patterns too . . . on virtually any type of surface — wood, metal, plastic and glass — can be obtained with Sans-Arb and Sans-Marb, Meyercord's durable, flexible photo-lacquer veneers. Critical materials are not required for application. All over finishing, banding or trim are easily and speedily accomplished in a fraction of conventional finishing time. Each sheet of Sans-Arb represents many hours of finishing work. It's the equivalent of buying your lacquer in "pre-sprayed" sheet form . . . with wood grain patterns included. Filling, staining, sealing, rubbing and undercoating are unnecessary. Machine or manual applications apply up to 4500 feet per hour. Space does not permit telling the whole story of Sans-Arb . . . its new uses . . . new application method. Investigate its amazing utility. Address Dept. 1477.

STOCKS AVAILABLE FOR IMMEDIATE DELIVERY

THE MEYERCORD CO.

5323 WEST LAKE STREET • CHICAGO, ILLINOIS

work is withdrawn from the tank it is not necessary to remove the excess sealer from the surface. It will drain down and continue its impregnation.

Much of this aircraft work is being done by concerns who formerly made furniture and cabinets. The finishers are familiar with ordinary wood sealers which are usually sprayed. The chief function of such sealers is to stop suction, so that succeeding finish coatings are held out to form a full finish. The finishers like the speed of spraying. However, let me stress the fact that the prime purpose of this plywood sealer is to impregnate the wood against moisture. I know of no sealer that will accomplish this without being so applied that it will have time to thoroughly penetrate down into the smallest wood fibers.

This application of sealer can be accomplished by spraying if the surface is kept wet long enough. It would require very low air pressure so that the sealer would not be too highly atomized and be too dry when it makes contact with the wood. It is my experience that it is necessary to go back and forth over the work so often that any usual advantage of the spray method is lost.

If the dipping method is not feasible, I prefer application by brush, mop or flow coat. Flow coating is accomplished with equipment that requires a comparatively small volume of sealer to be in use at one time. The sealer is delivered to a nozzle, or series of nozzles, by means of a material pump. The sealer flows over the work and down into a pan. It then is returned to the pump and recirculated.

Drying Time—It is not necessary to have the sealer entirely dry, if no other operation is to be performed before the work is again recoated. I prefer to air dry the sealer coat at room temperature, for about two hours, or force dry 45 minutes at 130° F.

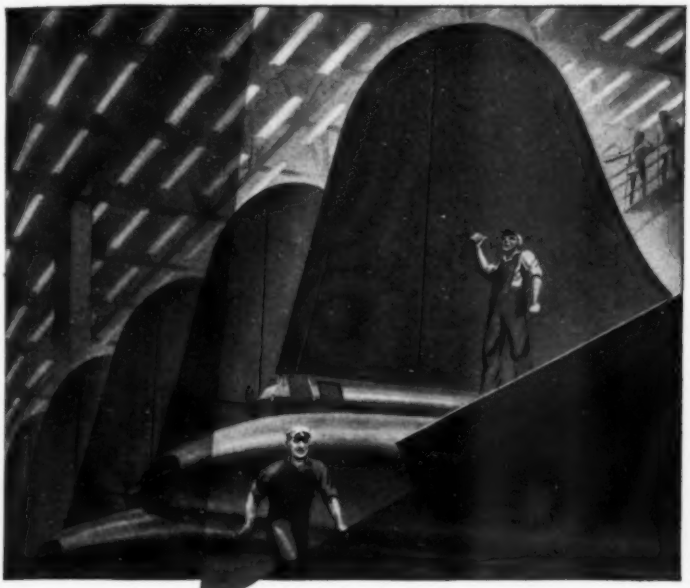
Added Functions—In addition to moisture proofing the wood, this sealer provides a bond for succeeding coatings. It penetrates into the pores of the wood, thus preventing the entrapment of air that might later cause pinholes. It further prevents excess absorption of the liquids in the succeeding application of paste filler. Without this sealer coat, the wood would take up these liquids and leave the filled too dry.

2) BURNISHING WITH WOOD FIBER—It is not advisable to use sandpaper or steelwool to smooth the work after the sealer coat. To do so may cut off protruding fibers, thus causing them to be open tubes through which moisture might find its way. I prefer burnishing with wood fiber such as tree moss or excelsior. After drying two hours the sealer cleans up with little effort.

3) PASTE WOOD FILLER—(Sometimes called "Pigmented Sealer") If a smooth finish is to be obtained on mahogany and similar large pored wood, the pores must be filled level with the surrounding surface.

The paste wood filler commonly used on furniture is too short for aircraft work. The filler I prefer contains the same resin as the sealer and provides a second sealer coat. If some spongy sections have not been thoroughly sealed with the first application, the filler completes the sealing of such sections and fortifies the entire area.

Application—Reduce two parts filler to one part VM&P naphtha, brush on liberally and work into the open pores with the brush. Permit the solvent to evaporate for 10 or 15 minutes. At this



Lowe Brothers Lacquer Finishes are a Boon to Aircraft Production

Many manufacturers of aircraft—bomber, glider and trainer—are faced with the problem of finishing large surfaces within the limits of available time, space and equipment.

Now, lacquer finishes developed by Lowe Brothers have solved this problem. Not only is the number of coats, necessary to give the specified protection, cut from 6 to 3—but the application time is reduced by nearly 50%.

These Lowe Brothers-developed lacquer finishing systems are being installed and used with time-and-labor-saving effectiveness to speed the finishing of many aircraft surfaces.

Whatever your finishing problem, you can depend upon Lowe Brothers broad experience with Government specifications and other industrial formulations to be of help to you. For information, bids or other data, consult

INDUSTRIAL SALES
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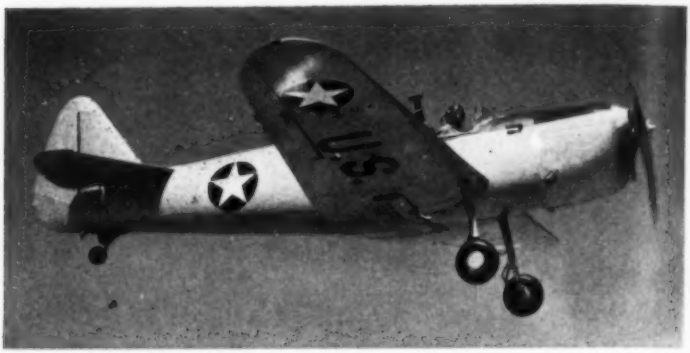
WARTIME FINISHES *for Industry*
IN ACCORDANCE WITH U.S. GOVERNMENT SPECIFICATIONS



The Ryan PT-25 plastic-bonded plywood military primary trainer in flight. Aluminum alloys and all strategic materials have been eliminated in this plane, with the exception of the engine cowling which represents less than 2% of the total weight of the airplane. No forgings, castings or extrusions are used, nor are critical steels used for any of the fittings or structural parts. Ryan Aeronautical Co. official photograph, San Diego, California.

point the filler will contain very little volatile material, yet it will be plastic and workable.

The particular advantage of this formulation is that the ordinary paste filler must contain considerable volatile before it is worked into the pores of the wood. Upon evaporation of the solvent there is then quite some shrinkage of the filler in the pore. With the filler used on aircraft work, it is finally worked into the pore with a content of practically no volatile and practically no shrinkage after thorough curing.

After the filler is spread over the work and permitted to dry to a dull sheen, it may be padded further into the pores of the wood and wiped off, preferably with tow, across the grain. It is then wiped with the grain to a clean, level surface.

Drying Time—In some schedules the filler may be recoated after air drying for half an hour or so. For this particular schedule, I prefer an air dry of about three hours, or force dry one hour at 130° F.

4) FAST-SET SPRAY COAT—This is the same basic material as the sealer used in the first operation. The solvents have been adjusted to make possible greater ease of spraying, since that is the only method that will be used for applying it. It does not need the impregnating qualities of the first coat and may be made to dry more rapidly. This material contains the same percentage of solids as the first coat sealer and has the same water impermeability quality.

Any pigmented material, such as the filler, is porous to some extent. Air may be entrapped in such a coating. This spray coating is insurance against pinholing and is further fortification against moisture.

Application—Reduce with equal volume of solvent and spray a medium wet coat.

Drying Time—Air dry at room temperature 1½-hours, or force dry ½-hour at 130° F. [*to page 20*]

It's a good shoe, but . . .

Just because it's a good shoe doesn't mean it will be comfortable on every foot. And just because an industrial finish meets Army or Navy specifications doesn't mean it is suited to the conditions and equipment of *your* plant! There may be many formulations that will meet a given set of specifications; but for best results, for speediest application, you want the one that is best suited to *your* individual requirements.

Ault & Wiborg—leaders in industrial finishes for 65 years—excel in making finishes that "fit." Each month, the A&W Laboratory turns out more than 600 new or revised formulations, carefully checked, not only by "test tube" methods, but with actual production line techniques. It's a tough job, but it's the way we have earned our reputation as "Builders of Fine Industrial Finishes." If you have a finishing problem, may we work with you to help you solve it?

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"A&W RESEARCH: *A Symbol of Progress*"—the interesting story of the research program which has helped to establish A&W as "Builders of Fine Industrial Finishes."

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MAKERS OF POLYMERIN* — THE ORIGINAL SPEED-BAKE FINISH

*Reg. U. S. Pat. Off.

5) BURNISH—with tree moss or excelsior.

6) SURFACER — This is a synthetic resin-base surfacer. It has the flexibility and moisture resistance demanded for aircraft work. Since its whole purpose is to make perfect smoothness possible, it contains the proper amount and kind of pigments to accomplish this. We will discuss surfacers in general further, later on in this article.

Application—Reduce two parts surfacer to one part hydrogenated naphtha No. 2. This gives about 44% solids at the spray gun. Spray a full wet coat.

Drying Time—Air dry one hour at room temperature or force dry 20 to 30 minutes at 130° F.

7) WET SAND—Wet or dry sandpaper, not coarser than No. 320, and water should be used. This is an exacting operation, much like that employed in cutting down a lacquer or varnish film on furniture prior to rubbing. Unless the surface is sanded smooth, the value of the operation is nullified.

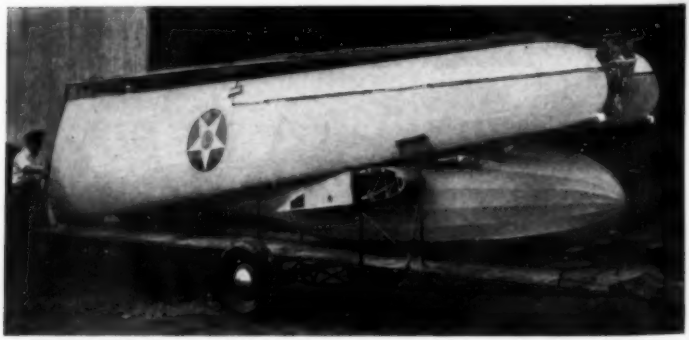
8) FINISHING ENAMELS—Any of the following finishing enamels may be applied in the specified colors:

A) Aluminum—Use about 12-oz. of aluminum bronze powder in one gallon of aluminum vehicle, at spraying viscosity. This varnish is a heavy liquid that permits proper leafing of the aluminum. This is quite important, as a vehicle that fails to permit proper leafing of the aluminum does not provide a film with satisfactory weather resistance.

B) Gloss Enamel to comply with specification AN-E-3. This enamel is most often supplied in yellow, red or blue for finishing training planes. It air dries overnight, or may be force dried.

C) Gloss Lacquer Enamel to meet specification AN-TT-L-51. May be used in place of synthetic enamel where specified. This, like all lacquers, has only about half the covering capacity of a good synthetic enamel. It has the virtue of quick drying. This lacquer may be recoated within a few minutes, and dries hard in about one hour.

D) Camouflage Enamel to comply with a specification. This dull,



A glider completed and ready for its test flight. Each glider has its own individual trailer by which it can be moved easily and quickly—in the field or over any highway. Official photograph of U. S. Army Air Forces.

Permite Ready-Mixed Aluminum Paints have gone to war. But they will be available for the greatly expanded uses which the return of peace will bring.

● Shot, shell, bombs or hand grenades can be sprayed with Permite Government Specification Ammunition Lacquers **immediately** after they come out of the hot alkali bath. No time lost for drying and cooling. Permite Ammunition Lacquers do not crack or blister when applied to the hot surfaces.

Even further production time is saved, because the hot shells, bombs or grenades can be handled as soon as two minutes after being sprayed. Permite Ammunition Lacquers have made an exceptional record for quick drying. And they save costs because every gallon gives extra coverage.

The experience of our technical staff is at your service in supplying Permite Government Specification Finishes to meet your particular requirements for finishing ammunition or other war production supplies.

Quotations on any finishing needs submitted promptly upon request.

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PERMITE *Industrial* **FINISHES**

synthetic resin enamel covers solidly in one spray or brush coat. The finish is unaffected after an 18-hour immersion in naphtha, water or hydraulic fluid. It has excellent resistance to extremes of weather. The outstanding feature of this enamel is that although it is a synthetic resin enamel with more than 60% solids, it air dries hard in about one hour at room temperature. Most enamels with this high percentage of non-volatiles require an overnight air dry.

E) Camouflage Lacquer Enamel to meet a specification. It is specified for some work. There is little reason to use this lacquer in preference to the synthetic enamel just described. There is little, if any, advantage from a standpoint of quick drying. This is an excellent finish, however, for any one who prefers lacquer.

Briefly, this Schedule I, for use on open-grained wood where maximum smoothness is desired, is:

Operation (Schedule I)	Air Drying Time	Force Drying Time
1—Sealer; dip coat	2 hours	¾ hour
2—Burnish with wood fiber		
3—Filler; brushing on	3 hours	1 hour
4—Fast-set spray coat reduced	1½ hours	½ hour
5—Burnish with wood fiber		
6—Surfacer; spray on	1 hour	½ hour
7—Wet Sanding		
Total time for undercoats	7½ hours	2¾ hours
8—Finish coats of aluminum or enamel		

Any successful surfacer must contain sufficient inert pigment to provide the desired build. Such a material, being more or less porous, cannot be as impervious to moisture as a properly made synthetic resin sealer.

It is my belief that heavily pigmented surfacer offers a greater liability to checking and alligatering. This, I believe, is true of all surfacers and sealers as a class.

To complete my indictment of pigmented surfacers, tests show that they do add more weight to a plane. As stated in my introduction, it may be well to sacrifice perfect smoothness in the interest of better moisture impermeability and less weight.

Schedule II—for Finishing Plywood Aircraft

This schedule is offered for best moisture impermeability and less weight. In this schedule, the sanding surfacer is eliminated.

Sanding Surfacers

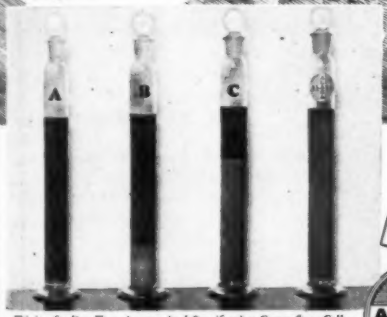
Many finishers prefer a sanding surfacer as the best means of obtaining perfect smoothness. Certain specifications permit the use of such a material. It is my experience, however, that the surfacer may be eliminated in favor of another coating of spray sealer, applied full body. This coating will offer much more in the way of moisture resistance. See Schedule II, System II.)

System I on Schedule II

This is a minimum finish schedule. It more than meets the moisture impermeability specification but is not as full a finish as provided by Systems II and III.

1) Sealer; dipped; air dry 2 hrs.
2) Burnish with wood fiber.
3) Filler; air dry two hours.
4) Burnish with tree moss or dry sand lightly with fine paper.
5) Apply finishing coats of enamel or aluminum. [*to page 24*]

Only Extra Performance wins!



This is a Settling Test. 4 recognized Specification Camouflage Cellulose Nitrate Lacquers, including ALAKA, were all measured and placed in these identical glass graduates at the same time. Note almost total lack of settling of ALAKA.

14105-B

U. S. ARMY AIR CORPS
SPECIFICATION 14105-B
December 17th, 1942
Superseding Specification 14105-A Sept. 10, 1942

LACQUER
CELLULOSE NITRATE
CAMOUFLAGE

ALAKA

Extra Performance

DOES YOUR CAMOUFLAGE LACQUER SETTLE BADLY?
Most materials of this type settle badly... some more than others. ALAKA settles too . . . but very little . . . and when it does, it readily stirs into suspension again.

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Many materials of this type chalk excessively. ALAKA chalks too . . . but only to a very minor degree.

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ALAKA meets the specification non-specular gloss when manufactured, reaches the user with that specified gloss and retains its specified gloss regardless of the time of storage before use.

DOES YOUR CAMOUFLAGE LACQUER LIFT?
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214-220 FORTIETH STREET • BROOKLYN, N. Y.

System II on Schedule II

This gives better moisture impermeability and a much smoother surface than System I.

1) Sealer; dipped; air dry 2 hrs.
2) Burnish with wood fiber.
3) Filler; air dry two hours.
4) Burnish or light sanding.
5) Fast-set spray coat (spray full weight and a full wet coat); Air dry three hours.
6) Burnish with wood fiber. For a smoother finish, this coat may be sanded lightly with No. 400 wet-or-dry sandpaper and water.

Total air dry time for undercoats, 7 hours.

7) Finishing coats of enamel or aluminum.

System III on Schedule II

This system offers a somewhat smoother finish, and with slightly better moisture impermeability than System II. It is identical with System II, excepting that 12-oz. of aluminum bronze powder is added to the fast-set spray coat.

It is the contention of some finishers that aluminum does not enhance the moisture impermeability of a material like this sealer. However, tests by prominent testing laboratories, indicate that there is a definite value in the use of aluminum. Not only does it aid in stopping the passage of moisture but it makes for easier smoothing of the coating. It is essential that the vehicle be heavy enough to permit leafing of the aluminum.

In view of these claims for aluminum, you might ask why it is not used in the first coat of sealer. My answer is that this first sealer is an impregnating coating and aluminum will retard the impregnation.

In schedule II, where no sanding surfacer is employed, all coating materials are made on the same resin base. This results in compatibility between all coatings with the same coefficient of contraction and expansion. For this reason, it is my belief that, in evaluating a finish for plywood aircraft, a complete schedule should be considered rather than individual materials.

Sealing Interior Surfaces Too

It is essential that all interior surfaces be impregnated with the sealer in compliance with the specification. Failure to accomplish this will surely result in trouble.

A finisher of my acquaintance recently received a wing tip from another manufacturer. This tip had been sealed on one side but the other side was unfinished. It had been exposed to damp air long enough for the wood to absorb considerable moisture.

This was a tightly moulded member and as the wood swelled from its moisture content, the sides of the piece buckled. It was placed in a drying oven at low temperature. After several hours the excess moisture was expelled and the piece resumed its original shape. Had it been sealed on both sides, this fault might not have occurred.

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After many vicissitudes and delays Volume 6, of the Chemical Formulary is now ready for distribution. The Chemical Formulary, as is known to many, is a collection of valuable, timely, practical commercial formulas and recipes for making thousands of products in many fields of industry. All the formulas in any of the six volumes are different. There is no duplication or revision in succeeding volumes.

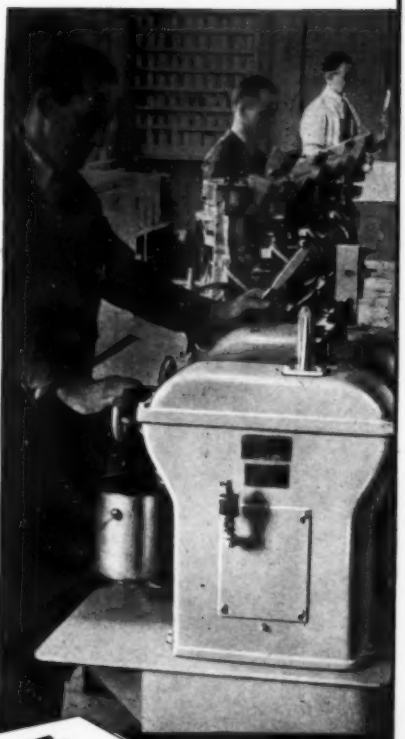
Volume 6 contains many formulas for military as well as civilian uses. An index of more than twenty pages, fully cross-referenced, adds to the utility of this encyclopedia of formulas and recipes. Copies can be obtained through INDUSTRIAL FINISHING. Price, $6.00 per copy.

Wartime RESEARCH FOR POST-WAR FINISHING

Modern Ferbert-Schorndorfer laboratories are the scene of countless tests and experiments run daily by experienced scientists and technicians.

Today our manufacturing efforts are directed 100% toward producing finishes that protect and preserve the modern implements of war. Our research staff, as well, is also completely engaged in developing new methods and finishes necessary to winning complete victory.

These laboratory improvements, now being thoroughly tested in the field, will be of equal importance in producing superior protective coatings for post-war products in the automotive and metal finishing fields.



FERBERT-SCHORNDORFER COMPANY

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Testing Coatings Used on Sheet Steel

By JEROME M. BIALOSKY, B.S., Ch. E.

What tests to make on protective coatings to determine—
Film Thickness
Resistance to Reagents
Porosity
Physical Characteristics
Permeability to Moisture
Flexibility
Adhesion
Color and Gloss

CORROSION RESISTANCE is not a definite measurable property, as is weight or volume. It is rather a comparative term which eludes precise evaluation, because it varies with the corroding medium and with conditions of attack. However, comparative tests can be made, using standard corroding mixtures. The results of these tests can be interpreted into service life by comparison with coatings of known characteristics.

A fact often overlooked in corrosion tests is that the degree of resistance actually required will vary with the service expected. To illustrate this point it is only necessary to determine whether corrosion failure in the case in question means impairment of the appearance, structural failure, or discolorations or contamination by products of corrosion. Interpretation of test results should be made, using the above as a criterion of suitable resistance.

Often when resistance to a specific reagent is required, the simplest answer to the problem lies in the use of a different metal that has suitable properties. Frequently this substitution is not desirable because of the cost or mechanical requirements—that is, strength or weldability. The use of clad or coated steel is a possible solution for this problem.

Protection of steel by metallic coatings may be obtained by either anodic or cathodic coatings. By anodic protection we infer the use of a metal having less resistance than the steel base, and which protects the steel by being corroded in preference to the base metal. Zinc, cadmium, and aluminum are examples of anodic coatings on steel. Cathodic protection differs from this by forming *a continuous surface coating which is more resistant than the steel base.* Common cathodic coating metals are chromium, copper, lead, nickel and tin.

It is generally accepted that the degree of protection afforded by a metallic coating is in propor-

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For GREATER EFFICIENCY

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DEOXIDINE #170, admirably suited to the processing of steel shell cases, is but one of a number of grades of ACP acid cleaners. The immersion process in which it is used is adaptable to the cleaning of many other ordnance or marine parts. Other grades of DEOXIDINE are available for brush or spray processes where these are indicated for expediting production.

DEOXIDINE #170 is a chemical that removes light oil, annealing scale and eradicates rust and rusters, producing a clean, minutely-etched, paint-receptive surface. The rusters, even though invisible, are destroyed, eliminating the possibility of defects developing beneath the protective finish. DEOXIDINE does not produce a coating on the cleaned surface which on shell cases, for example, might crack in crimping and in obturation and ruin the protection of the final finish.

DEOXIDINE meets U.S. Ordnance Department requirements for its efficiency in removing rust and neutralizing rust producers before protective finishes are applied.

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tion to its thickness. This can be determined without damaging the coating by the use of either the Aminco-Brenner Magne-Gage (1) or the G. E. Thickness Gage (2)*. These gages have found widespread use for production testing.

Destructive methods of determining film thickness have been in use since coatings have been applied. They have the obvious disadvantage of spoiling the finish and they require more time, but usually they are more exact than the non-destructive methods. Destructive tests include the following:

Quantitative stripping of the coating from a known area. This is the standard method for galvanized sheet, using antimony hydrochloride.

Physical measurement, as the Chord Method or the Microscopic Method.

Selective solvents which have uniform solvent rates. The thickness is determined by the time required to strip the coating. These include the Hull and Strasser dropping test (10), the jet test, and the Preece test (9).

Porosity of Metallic Coatings

Porosity of metallic coatings is an indication of their service life. Common tests for porosity are the salt spray (6), hot water immersion, hydrogen evolution, and the ferroxyl tests. Salt spray tests are used as quality tests and require careful interpretation of the results if they are to be of value. The cabinet is operated at 85° or 100° F. and 5% or 20% concentration of salt. The hot water test requires immersion of the test piece in boiling distilled water for six hours. In the two preceding tests, porosity can be detected by the presence of rust spots. The ferroxyl test requires a reagent made up as follows: Sodium chloride, 10 gms.; sodium ferricyanide, 1-gm.; agar-agar, 10-gms.; water to make 1000-ccs. The reagent is applied hot to the test piece, and porosity is indicated by the appearance of a blue color at the pinhole.

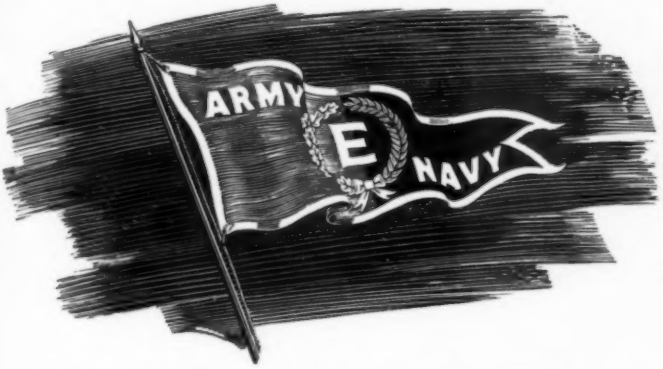
Many coatings are finishing operations and receive no working except a polishing. In the case of galvanized, tin or terne plate, this is not the case. These products are frequently raw materials for some manufacturing operations which may include blanking, forming, shearing and seaming. The coatings must have the proper physical characteristics to withstand these operations. Tests applied to these coatings often include cupping or drawing tests, bend tests using a mandrel of specified diameter; and, in the case of wire, coiling the wire around its own diameter. To pass these tests, no flaking or peeling of the coating should be evident.

Organic Coatings

The resistance of a metallic coating on steel to a specific reagent is frequently known from experience. This is seldom the case with the newer organic coatings. The service of an organic film depends not only upon its thickness, porosity, physical characteristics, but also upon its composition, pigmentation, permeability to moisture, flexibility, and adhesion. Composition and pigmentation are the manufacturers' problem and will not be discussed further.

The resistance of the coating to moisture can be determined in salt spray and humidity tests. The results are usually expressed in numerical values ranging from 0 to 10, the latter indicating the most resistance. [*to page 30*].

*See references at end of article.



"An Honor Not Easily Won Nor Lightly Bestowed"

In accepting the Army-Navy "E" Award, we also accept the responsibility of maintaining or surpassing the standard of performance which brought us this honor. ¶ We pledge continued volume production of protective coatings for aircraft, Radar, ammunition cases, shells, packing boxes, gun mounts, landing mats, bomb sights, as well as finishes for the Engineer Corps, Chemical Warfare Service, Ordnance, Bureau of Ships and Quartermaster Corps. ¶ Our intention is to implement our war effort to the utmost, in order to hasten the war's end . . . to assist manufacturers of war equipment in attaining greater production . . . to develop protective coatings to meet changing requirements as revealed by field operations. ¶ Experience thus gained in the solving of war finishing problems . . . in the use of necessary substitutes, and in the more efficient use of production equipment, will contribute to better post-war finishes . . . at lower cost.

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Tests to determine resistance to a specific reagent can be carried out with test cups, panels, or disks (12), suitably coated and prepared. Panels are perhaps more readily available than test cups, but have an edge condition which is a weak spot and may not be true to conditions actually occurring in production. The edges of the panels may be coated with paraffin to eliminate this condition.

The choice of specific reagents depends entirely upon the condition met in service. Reagents in the following list have been used and will serve as a guide:

Distilled water
Boiling water
Ice water

5% hydrochloric acid
5% sodium chloride
0.5% sodium hydroxide

Soap solution
5% Acetic acid
1% Citric acid

Vinegar
Coal Tar Solvents
Petroleum Solvents

Alcohols and Esters
Gasoline and oil

The list given here is not all-inclusive and not every reagent named is used by any individual laboratory. The temperature at which the tests are conducted depends on the available facilities. The usual temperature is room temperature, but 100° and 125° F. have been used. The duration of tests may be a week to a year. When making this type of resistance test it is important to record the following data: reagents and their strength, temperature, starting date, condition at each periodic inspection, and the date of such inspection. Such inspection may be timed as follows: one day, two days; one, two and three weeks; one, two, three, four, five, six, and nine months; and one year. Note any evidence of rust, blisters, softening, checking, or discoloration when making the periodic inspections.

Thickness and Flexibility of Coating Film

The thickness of organic coatings can be measured by the same non-destructive methods previously mentioned under metallic coatings. Another instrument (3) is available which measures the thickness of a paint film by forcing a needle point through the coating. When the point reaches the base metal a light indicates the contact and the thickness is read on a dial gage. A destructive method uses a micrometer to measure the over-all thickness of the piece before and after the coating has been removed from the area tested. The non-destructive methods have the advantage of being usable on large or small pieces.

Flexibility of the coating is determined by means of a button test or a bend test around a mandrel. The A.S.T.M. Conical Mandrel (7) has the advantage of varying the amount of stretching across the width of the panel. Adhesion is frequently determined by scratching the coating with a finger nail or knife blade or coin.

Impact tests indicate both flexibility and adhesion. The usual impact machine makes use of a falling weight which drives a ball-faced indentor onto the back face of the panel. The size of the falling weight and the distance of free fall vary with each unit. There is no standard impact testing machine used for testing coatings.

Abrasion resistance may be measured by allowing an abrasive, such as sand or carborundum, to fall on the surface under some fixed condition. The amount of abrasive required to wear through

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- Metal primers for tanks, blitz cans, bombs, gun mounts, etc.
- Lusterless Enamel Finish Coats for use over metal primer.
- Camouflage paints or compounds for metals and textiles.
- Coatings for roll coat application on land mines, gas mask canisters, hand grenades, etc.
- Interior coatings and sanitary lacquers for food and beverage containers.

GENERAL INDUSTRIAL FINISHES
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PROTECTIVE COATINGS
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the film is a measure of abrasion resistance. An instrument (4) has been placed on the market which used standardized abrasive wheels pressed against a rotating sample under standard pressure.

Color matching has been an art which was handed down from the aged to the youth of the profession. The use of instruments for determining colors and evaluating the color in numerical terminology is a recent innovation. Such instruments as the G. E. Recording Spectrophotometer have demonstrated the actual specification of color as numerical values. The development of simpler and less expensive instruments for abridged spectrophotometry or tri-color colorimetry (5) will expand the use of precise color specifications in industry.

Gloss measurements are frequently made by visual comparison with accepted standards. The A.S.T.M. (8) or Hunter Glossmeter uses a photocell to determine the specular gloss. Although color and gloss cannot be construed as corrosion tests, these properties of an organic coating are frequently specified and are mentioned here for that reason.

Before any tests are made, it is essential that the following precautions be taken in the preparation of panels or cups:

1) The metal used for tests should be identical with the steel actually used for production, in regard to analysis, heat treatment and, where possible, to gage.

2) Cleaning and pretreatment should duplicate methods used in production.

3) Standard polishing and electroplating procedure should be followed.

4) Reduce organic coating materials with proper quantity and quality of thinner. Apply in same manner as production line set-up.

5) Bake or air dry, using same time and temperature as production schedule.

6) Coat or plate to proper thickness.

7) Use actual production piece for tests when possible.

The value of any corrosion test lies in the accurate interpretation of the results in terms of service life. Complete records of all data are essential and it is suggested that a test be made for every test run. Since every laboratory has different specifications for its products, no uniform record form can be used. In view of changing availability of many coating materials and development of new materials, the possession of complete records is a valuable asset. By such records the value of new materials can be determined by comparison with materials of known test and service performance.

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Production for War!

DeVilbiss Guns quickly check the Sea and Air Attacks of Corrosion!

SINCE the Navy raised its goal to a fleet for the *seven* seas, industry must get up steam on Navy contracts. And it isn't enough that sea weapons be *built* well—they need a tough *finish* to repulse severe corrosive attacks.

Look how these two Navy contractors are meeting these war demands with DeVilbiss Spray Systems. At the Edo Aircraft Corporation, DeVilbiss Gunners are fast-finishing floats for seaplanes. Another DeVilbiss Gun crew is spraying switchgear boxes for fighting ships at I. T. E. Circuit Breaker Company.

DeVilbiss Equipment is speeding protective coatings on an immense range of war products, from tiny shell fuses to huge clipper ship fuselages. And in between, you'll find bombs, landing boats, tank destroyers and gliders getting a fast, durable finish with DeVilbiss Guns.

If the Navy is calling for full speed ahead in your plant, DeVilbiss can help you with a high-speed finishing system. Your nearby DeVilbiss man can show you how.

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Photo by U. S. Army Signal Corps

THIS new EGYPTIAN rough finish is already in sharp demand for war products and essential civilian items that have metal surfaces requiring a rough finish. Radio sets, instrument panels, fire control and listening devices are "naturals" for PEBBLE-TEX, a tough, durable finish made to stand up under severe exposure.

Note these outstanding advantages of PEBBLE-TEX:

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2. Simple to apply with pressure type spray gun. Varying degrees of texture obtainable from same mix by gun adjustment.
3. PEBBLE-TEX pattern in one coat. For full metal protection use over a primer.
4. Comes in a variety of colors.

Here are shown actual photographs (unretouched) of panels finished with PEBBLE-TEX. Above shows coarse texture.

This panel shows a finer texture. The size of the pattern is regulated by spray gun adjustment and application technique.

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Cleaning Steel Drums

BY H. R. WILLIAMS

NEW STEEL DRUMS are being manufactured today for only a few limited uses—principally for Army, Navy and Lend Lease, and for some products vitally needed by war industries that cannot be shipped in reconditioned drums or in containers of wood or other material.

The necessity of conserving steel drums now available is one of the serious problems facing industry. Neither new nor used drums can be purchased for packing many products and manufacturers are forced to conserve containers they now have available.

An inverted open-end drum is being placed in this machine for interior cleaning by an abrasive blast stream.

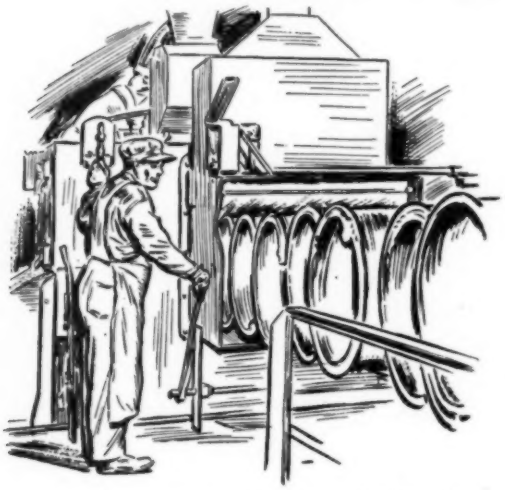
A steel drum, properly handled by the packer and the packer's customer, and if properly reconditioned after each use, can make 15 or more trips before its useful life is at an end.

Steel drum reconditioning is not new. Many products long have been packed in "second-hand" drums previously used for the same, or for a lighter product.

Some manufacturers have been doing their own drum reconditioning, while others have had commercial drum "laundries" handle this work for them. The importance of commercial reconditioning plants has grown recently as manufacturers who previously had been using new drums exclusively are now required to reuse their containers—and as other manufacturers, who had divided their production between new and reconditioned drums, are now restricted to reconditioned drums and limited in reconditioning capacity.

The Newark Steel Drum Co., with a large plant at Linden, N. J., is one of the pioneers, and probably the largest steel drum "laundry." This company has introduced cleaning practices which have been adopted by similar commercial plants and which are now incorporated in drum-cleaning departments of drum users.

The Linden plant cleans and reconditions more than 500,000 drums



Drums rolling into a machine wherein their outside surfaces will be cleaned of all paint, rust, labels, etc., by streams of abrasive thrown from two rapidly revolving wheels.

a year. Up to 90,000 drums, a great majority of them belonging to drum-using companies, are in the company's yard for reconditioning. The company normally buys used drums, reconditions them, and then sells the cleaned drums—but under WPB regulations used-drum purchases are regulated, and now by far the greatest number of drums reconditioned are owned by other companies.

Drums arrive at the plant by rail and truck. Covers of full-removable-head drums, and bungs of tight-head drums, are left on to keep rain and moisture out, and to prevent, as far as possible, exchange of air within the drum while in the yard. Exchange of air would bring in new moisture to rust and corrode the metal.

Cleaning operations here differ from those of other drum cleaning plants, in that equipment employing an abrasive blast stream is used to clean the exterior of all drums, and covers and interiors of drums with full - removable heads. The insides of tight-head drums are cleaned in the conventional manner—by soaking and flushing in a solution, with composition of the solution dependent upon use to which the drum previously had been put.

Cleaning Outsides of Drums

Drums are placed on an inclined track or conveyor leading to a Wheelabrator blast-cleaning machine. In this machine, designed for Newark Steel Drum Co. by American Foundry Equipment Co., Mishawaka, Ind., drums are introduced one at a time and subjected to abrasive blasts thrown by two centrifugal wheels as the drums are spun on rollers under the abrasive-throwing wheels. The abrasive blast strips the drum exteriors clean of all paint and rust. The machine handles 150 drums an hour. One man controls the movement of drums into the machine, and another receives the drums as they are discharged.

This cleaning method has been adopted by many plants in the metal industry for cleaning cast-

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Ammunition

Allocation requests to use critical raw materials, necessary to practically all protective coatings, must be filed by manufacturers of finishes with the W.P.B. on specified dates the first two weeks of each month. These requests cover orders to be shipped the following month, and must be filed even though the manufacturer may have the raw material in stock.

Though allocation requests are based on orders received as well as anticipated business, the scarcity of raw materials has recently resulted in authorization being granted *only for orders actually on hand.* End use, of course, must be sufficiently important to justify release of the raw material.

From this you will see that the receipt of your order by the 1st of the month, enables the manufacturer to include your requirements in that month's allocation requests. Failure to meet this time schedule may mean a full month's delay.

Orders should specify end use, contract number, specification and priority data, delivery date, etc. In this way we will be able to give you the best service possible.

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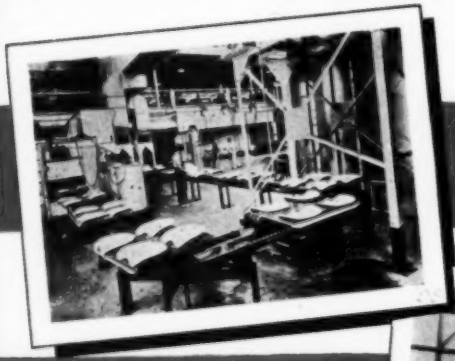
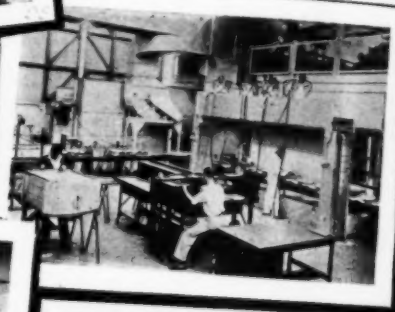
These are but a few



Finishing airplane seats with special Binks equipment in large plane plant.

Binks spray booths are so efficient that desk work can be done a few feet away.



Binks down-draft spray booth for finishing equipment in a U. S. Arsenal.

Binks painting equipment and exhaust system in large machine tool company.

BINKS MANUFACTURING COMPANY

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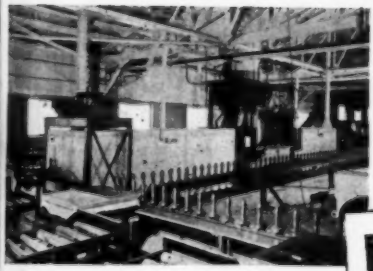
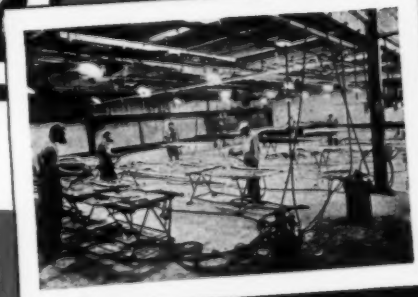
These are but a few of the hundreds of BINKS spray painting installations that are contributing to America's war efforts. The photographs shown here are some of the more obvious defense installations — the finishing of planes, shells, heavy machinery and tanks. Most of these installations involved special problems . . . the development of tailor-made equipment to meet certain specifications. Not shown are the countless BINKS installations in industries "behind the scenes."

◀ Gigantic spray booth designed and built by Binks for finishing war planes.



▲ Heavy castings and parts are easily sprayed in Binks tailor-made booths.



▲ This Binks automatic equipment coats 1,000 shells an hour in an Ordnance plant.

Binks spray guns, tanks, regulators and hose serve gigantic airplane industry. ▶

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ings and forgings of sand, scale or rust. Two centrifugal airless abrasive-throwing wheels, or blast units, are placed in this machine so they clean the ends and sides of each drum. The wheels are driven by individual motors through V-belts. They turn 2250-rpm. to propel steel abrasive against the drums at 11,500-feet per minute. Revolving action of the drum being cleaned subjects every part of its exterior surface to the full effect of the abrasive blast streams.

Cleaning Drum Interiors

Another Wheelabrator blast-cleaning machine, also specially designed for drum cleaning, is used to clean the interiors of full-removable-head drums. The open drum is inverted over a single abrasive-throwing wheel, and revolves as it is cleaned. In operating the machine, the operator places one drum on the loading station, while a drum previously loaded is being cleaned. As the clean drum is discharged from the machine, the drum to be cleaned enters the cleaning chamber and is positioned automatically over the abrasive - throwing wheel. The operator controls the cleaning time in accordance to the condition of the drum.

Spray painting interior of clean drum.

Covers of open-drums are cleaned as the flat table of this machine rotates under an abrasive-throwing wheel.

The force of the abrasive on the steel drum not only provides a clean surface, free of dirt and other foreign matter, but it slightly roughens the metal. This roughened surface is particularly desirable when drums are repainted as the paint or other coating makes a better bond than on a new steel drum or on a drum that had not been subjected to the abrasive blast. Certain synthetic resins, desirable for lining drums for certain chemical-industry applications, could not be applied satisfactorily to steel drums with a smooth finish, but they adhere perfectly to drums blast cleaned by this method.

A third blast cleaning machine is used to clean the removable cov-

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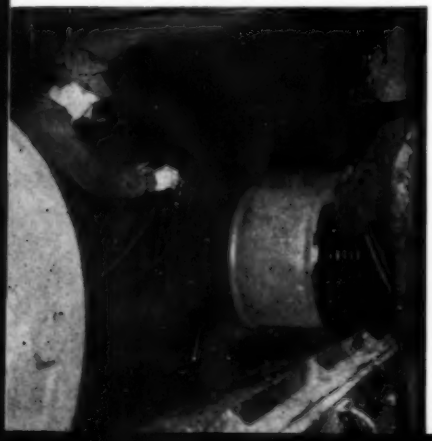
ers of open-end drums. This machine is one of several standard models of Wheelabrator Tablasts as used in the metal industry. The covers are placed flat on a revolving table that passes the work under an abrasive wheel within the machine. Covers are turned over and passed through the machine a second time to clean the opposite side.

Abrasive used by the three blast cleaning machines is automatically separated from rust, dirt, paint and metal removed in the cleaning process, and then returned to hoppers above the centrifugal abrasive-throwing wheels for reuse. The machines are grouped together, and are vented through a single "Dustube" cloth-bag type of dust collector.

Inspection; Relining; Painting

Cleaned drums are inspected and graded—some to be painted, others to be relined and painted. Drums are completely assembled and ready for delivery before spray painting the exteriors. Any color or combination of colors is used to comply with the customer's specifications. Many full-removable-cover drums reconditioned by Newark Steel Drum Co. are finished inside or lined with synthetic resins before the exteriors are painted. All finishes are baked.

Outsides of cleaned drums are spray-painted in the reconditioning process.



Cleaning Rough Castings

SOME types of metal products do not need to be sanded to a high degree of smoothness, before paint coatings are applied, but they do require cleaning and the removal of excessive roughness. In the case of small castings from the foundry, with considerable sand still adhering to the surfaces, it is customary to tumble or sand-blast them.

For large castings, where sand-blasting may not be the best solution, air-operated scaling tools are quite efficient for removing sand deposits from the surfaces. Scaling tools are also used for removing welding "berries." These tools are really portable air chisels of a type adapted to such work. Some of them have their air exhaust trained close to the chisel edge, so as to blow all dirt and foreign matter free as it is loosened by the chisel.

Goggles are always in order for those working near an air scaling tool. In fact, others in the near area usually need goggle protection more than the operator of the tool himself. Of course, the castings may be cleaned in a booth or back of a screen to protect nearby workers—if it is desired to do this rather than to insist on other employes wearing goggles. The booth or screen can be portable. It need be nothing more elaborate than a light frame to support canvas extending part way or all the way to the floor.—M. V.

PHOTO BY U. S. ARMY SIGNAL CORPS

• It takes more than powder and steel to make "Shot and Shell." Hand grenades, bombs, shells, land mines, flares, etc., must be properly identified by color and protected from the elements until used.

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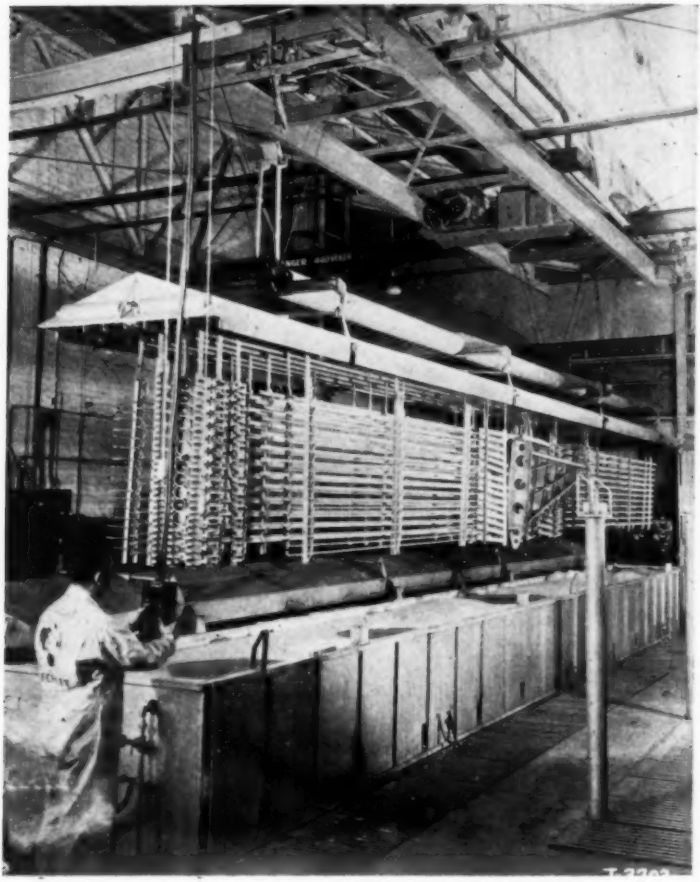


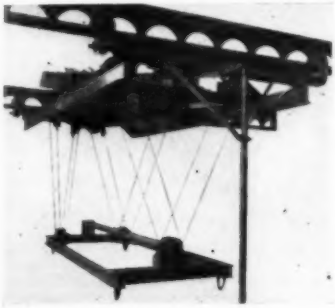
Non-Swaying Crane For Dipping Work

THE ACCOMPANYING illustrations [the other one appears on page 47] show the application of a traveling crane, with stabilized carrier, to large dipping tank operations—where it is necessary to lower and raise a charge into and out of a long narrow tank without any swaying or turning, which might cause the carrier to strike the sides of the tank. The huge tank shown here is used for anodizing operations in an air-

craft plant. The load can be handled without any tendency to swing one way or the other.

This work was formerly done by hand, or by means of guides and runners, therefore it is obvious that the savings in time and manpower, as effected by the present equipment, are considerable. The likelihood of spoiled work is also materially decreased.

Any tendency of the suspended load to swing or twist is eliminated by arranging the cables in such



Photographs, courtesy of the Cleveland Crane & Engineering Co.

a way as to provide for a triangular suspension which remains rigid while the load is being lowered and raised through a considerable distance. Its simplicity is apparent. The crane may be supported on two standard tramrails, or the carrier can operate on a double girder tramrail bridge, or in other convenient ways.—W. F.

Finish Salesman's Notes

A YEAR or so ago I ran across a good "stop-off." Perhaps it will come in handy for others.

Soak a pound of whiting in water. Then add about 1-oz. glycerine. This mixture will keep for a long time. I have some that I prepared more than a year ago and it is still good.

When spraying a picture frame or mirror frame and you do not wish to remove the glass, just brush the whiting mixture on the glass; then spray the frame. When the finish is dry, remove the whiting with a damp cloth or razor blade or bread knife. This masking coat will save the glass from paint marks and it also acts as a glass cleaner.

* * *

When I was learning the painting and decorating trade, the foreman on one job came to me and requested that I hurry the job before the paint gave out, as it was all he had of that color, and he did not wish to mix any more because it was a hard color to match.

* * *

I have been on the road 36 years and am still giving away lacquer samples. During those 36 years I have made many friends, a large number of whom I have shown how to use the spray gun. It was necessary for the prospect to know how to use a spray gun in order for him to be able to apply the lacquer I was selling. Many times I had to sell a spray gun (made by another firm) because I could sell a gallon of lacquer for my own company.

Many of the friends whom I have enjoyed knowing are now in distant parts of the country. I send them greetings and would like to hear from some of the old timers for "auld lange syne."—E. M. STEPHENSON.

One of the oldest patents taken out in the United States covered the japanning of pins.

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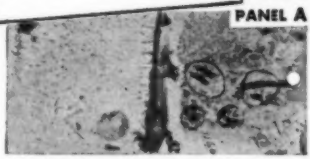

Panels show two pipe-line finishes. Panel A had 80 hours exposure in a Weatherometer. Panel B—finished with Sherwin-Williams Pipe-Line Finish—had 420 hours exposure in the Weatherometer. Its "Plus" performance is obvious!

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The information in this article is timely. I know from actual experience that it is the type of information many subcontractors of airplane parts are eager to get at this time. Our Finish Engineer at Douglas Aircraft was enthusiastic about the contents, and he checked carefully with me to make sure that the information is authentic.—

G. C. Close

Primers for Aircraft Magnesium, Aluminum

BY G. C. CLOSE

★

THERE is little reason to believe that the number of subcontractors furnishing parts to the aircraft industry have reached a saturation point. Our air program is expanding and will continue to expand until the end of the war.

Aircraft design is constantly improving, and aircraft companies when retooling preparatory to producing a new model, have found it expeditious to detail more and more work to outside manufacturers and reserve their own manpower for the retooling job and for the final assembly of airplanes. This means that more companies inexperienced in airplane design will be drawn into the field, and that changing designs will place new problems before companies already engaged in this type of work.

Prime Coating the Surfaces of Magnesium and Aluminum

Indications are that soon greater amounts of magnesium will be used in aircraft construction. Luckily, magnesium and aluminum present somewhat similar finishing problems. With either metal, priming is of paramount importance. A large majority of all subcontracted parts are primed prior to delivery to the purchasing aircraft plant. This places the responsibility for applying an adequate prime coating directly on the shoulders of the subcontractor furnishing the part.

It is the purpose of this article to examine the priming problem as it applies to the magnesium and aluminum alloys, and to attempt to answer a few specific questions relative to primers, their application, and the reasons for their use. To do this intelligently will make necessary a brief preliminary discussion relative to the chemical characteristics of magnesium and aluminum, and the surface treatments applied to control such

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A SPECIFICATION finish migh ok all right on paper, but som es you may have difficulty applyin to *your* product . . . in *your* plant.

For example, there was the mb manufacturer who was spray-fi ing his product with a specification el. His finishing line was origina de- signed and set up to handle ec mi- cally the entire plant output. Butt ble set in. Not only did the finishi ine lag behind in production, but int consumption was more than % above original estimates.

When a Du Pont War Servic an was called in, he quickly disc red the trouble. He knew that to fini the bombs economically, it was nec ary to apply a protective finish of *ad ate* thickness, with a *minimum* num r of

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ktravagant block-buster

or—how a Du Pont War Service Man saved paint and speeded production

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coats. His knowledge of war finishing specifications, aided by an accurate check with a micrometer, quickly revealed that the manufacturer was applying *more* paint per square foot than was required.

Excessive reduction of the finishing material was responsible. To secure adequate visual hiding, the operator had to make *two* passes with his gun. Thinner was wasted . . . time was wasted making the extra "pass" (the heavier finishing coat took longer to dry, too) and . . . finishing material was wasted.

With these facts established, the problem was quickly solved. Now, an adequate film thickness is being applied with *one* coat . . . paint consumption has been reduced . . . production has stepped up.

Not all finishing problems can be solved as easily as this, but Du Pont War Service Men can usually provide the answer. Their technical training and years of field experience have given them thorough knowledge of finishing processes and techniques. Remember, there is a Du Pont War Service Man in your area, ready to help you.

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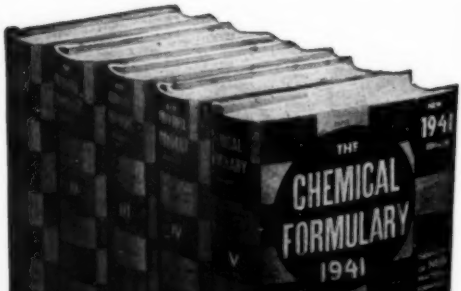

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chemical characteristics both before and after application of the priming coat.

From a chemical viewpoint, magnesium and aluminum are similar in that both metals are highly electropositive and oxidize rapidly when exposed to the atmosphere. The oxide coating formed on aluminum protects the metal from further attack and in itself acts similar to an initial surface treatment. The oxide coating formed on magnesium, however, is of little value as a corrosion inhibitor because it shrinks and cracks as it forms, leaving portions of the metal exposed to additional chemical reaction with the atmosphere.

With either magnesium or aluminum, this initial oxide coating does not offer enough protection to satisfy the demands of modern finishing practice. It is therefore necessary to subject the metal to a surface-treating process to create a surface that will control corrosion within the metal, as well as offer a satisfactory bonding surface for the priming coat to be subsequently applied.

Surface-Treating Aluminum Alloys

There are several known processes for surface-treating aluminum alloys. Each process has, as its result, the formation of an oxide coating sufficiently stable to protect the metal from corrosive attack. The most important processes are listed here in the order of their importance:

1) Anodic process.
2) Chromic-acid dip process.
3) Treatment with phosphoric acid or phosphate solutions.

The anodic process is superior to and more widely used than the other processes mentioned, but is applicable only to sheets and parts before assembly. It cannot be used for the treatment of localized areas in finished structures. When retouch work is necessary, where injury or fabricating practice has caused removal of the oxide film, it is common practice to re-surface-treat the area by swabbing with the chromic-acid dip solution.

Two Methods of Surface-Treating Magnesium

There are two common methods of surface-treating magnesium—the Chrome Pickle treatment, and Dow Treatment No. 7, the latter having been developed by the Dow Chemical Co. The Chrome Pickle treatment consists of a 2-minute dip in the following solution at room temperature:

Solution for Chrome Pickle Treatment

Sodium dichromate ($Na_2Cr_2O_7—2H_2O$)	1½ lbs.
Conc. nitric acid (Sp.Gr.—1.42)	1½ pts.
Water	enough to make 1 gallon

After the Chrome Pickle dip, the metal must be washed in cold water, then dipped in hot water to facilitate drying. The Chrome Pickle treatment cannot be used on parts of close tolerance, as the process removes 0.001 to 0.002-in. of metal per treated surface.

The Dow Treatment No. 7 is accomplished in two distinct steps. The first step consists of a 5-minute dip in a 15% solution of hydrofluoric acid. The second step is a 45-minute boil in 10% sodium dichromate. This treatment removes no appreciable material from the part being treated and it does not affect close tolerances. Adequate facilities are necessary for its use, however, as the fumes from the hydrofluoric acid or contact with the solution itself, is dangerous to the operator.

When magnesium or aluminum alloys are properly surface-treat-

ed, it is time to consider priming. A good primer for either metal will possess several essential requirements, and as many more desirable properties. The essential requirements are:

1) Resistance to water and moisture penetration.
2) Good adhesion.
3) Toughness and flexibility.
4) Good bonding surface for subsequent coats.
5) Inhibit corrosion.

The desirable properties are:

1) Rapid drying.
2) Resistance to spectral, subspectral, and ultra-spectral radiations.
3) Insoluble in substances with which the part will eventually come into contact (such as gasoline, oil, etc.)
4) Will maintain good adhesion even though softened by the application of subsequent coats.

It is doubtful if even an experienced finish engineer could name a primer with all the attributes just listed, without extensive investigation. But a knowledge of priming materials, coupled with a knowledge of the relative importance of the requirements listed (such knowledge based on the subsequent use of the part) will aid materially in the final selection of the most suitable primer.

Resistance to Moisture Penetration

Resistance to moisture penetration is without question the most important requirement of a primer to be used on aircraft. Moisture is responsible for a large proportion of corrosion in aircraft parts. This is particularly true when salt water is involved. Both magnesium and aluminum are susceptible to saline atmosphere. All organic finishes, and especially the camouflage finishes offer little resistance to moisture penetration, and it falls upon the priming coat to effectively prevent this moisture from reaching the metal.

Adhesion; Flexibility; Corrosion Inhibitive

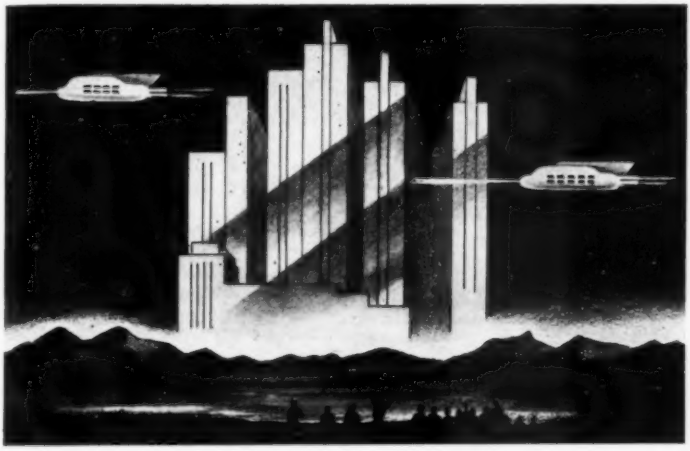
The need for good adhesion of aircraft priming materials is evident. Extreme temperature variations, severe whipping of exposed parts by the elements during flight, and high amplitude vibration are all factors that make good adhesion necessary. For the same reasons good adhesion between the prime coat and second coat is imperative.

A primer must be tough and flexible to prevent chipping during handling of the parts prior to application of the finish coat. Small areas, left exposed by such injury, may easily form a focal point of corrosion that will subsequently become extensive and dangerous to the strength of the part. The flexibility of a primer is also important to compensate for the expansion and contraction of the metal during the temperature variations met with during flight.

The corrosion-inhibitive characteristics of primers are due to the use of corrosion-inhibitive pigments. Pigments with an alkaline reaction, or those containing lead, are not suitable to use with the aluminum alloys. Zinc chromate, to date, has proved to be the most effective anti-corrosive pigment for use with aluminum alloys.

Zinc Chromate as Primer for Magnesium and Aluminum

The effectiveness of zinc chromate pigment, when used with magnesium, depends upon the conditions to be met with during the life of the treated part. Zinc chro-



MAKING KNOWN THE UNKNOWN

Once the war is won, what will happen to your business? How will peace affect production? And profits? In Stanley war-busy laboratories may rest the answers to these questions. Every industry will be touched by the war. Every product. Every part and process. For example, finishes . . . The finish of your product will doubtless be out of date. Not merely old-fashioned . . . but antiquated from the standpoints of efficiency, economy and utility. Your competitors . . . at least one of them . . . will have improved. You, too, will change the finish of your product. But the change will be too late. Business will be lost. The answer, of course, is post-war planning . . . planning done by expert finishing engineers . . . planning based on knowledge of the FACTS of finishing development . . . planning based on specialized EXPERIENCE. Your inquiry will incur no obligation. Address the Stanley Chemical Company, East Berlin, Connecticut.

Stanley Chemical

mate is very slightly soluble in water, and when moist conditions predominate, this slight solubility causes the chromates to enter into a reaction that oxidizes the magnesium metal and aids in corrosion prevention. On the other hand, when an acidic atmosphere predominates a chromate ion is formed which, in turn, depolarizes the magnesium metal and reduces its corrosion resistance.

It is important that the pigments used in primers have no harmful galvanic action with the metal on which they are used. For this reason neither graphite or carbon black is recommended, and should be avoided in primers to be used on either the magnesium or aluminum alloys.

Baked primers, though highly satisfactory in many instances, are not recommended for use with aluminum. This is because the heat required to bake the primer is quite liable to affect the physical characteristics of the metal and result in severe intergranular corrosion.

A great variety of materials are available to use as a vehicle or a binder for the primers. Here again, choice depends upon certain factors relative to the subsequent use of the part, and to the manufacturing process.

Drying oils, such as linseed, will give fair service when used as primer vehicles, but they dry too slowly for use in mass production. The phenolic resin varnishes and tung oil have good moisture resistance, but again, these are slow drying. The alkyd resins lack immersion resistance, but they are resistant to atmospheric moisture penetration.

Alkyd resins, combined with phenolic resins, are satisfactory primer vehicles. They combine flexibility with good adhesion, and are fairly fast drying. This combination will also make a durable finish coat.

The nitrocellulose lacquers are rapid drying but lack good adhesion and flexibility. A combination of nitrocellulose lacquers, with alkyd resins, improves the flexibility and adhesion but the strong solvents necessary in such a combination are liable to affect previous coats when applied.

The large number of varnishes and synthetic resins available, as well as hard resins and plasticizers, make possible the blending of primer vehicles with an almost unlimited range of possibilities. No finish engineer should be satisfied with results until he is sure he is using the best blend obtainable for his purpose.

An airplane, unlike most machines, becomes a vital part of the man who flys it. An aviator's safety is as dependent upon the perfect functioning of his machine as upon the perfect functioning of his own heart. *Aircraft design is no better than the finish applied to preserve it.* Let every finish engineer engaged in aircraft construction take that adage to heart!

Our men, tanks, guns, ships and planes are winning the war—and finishing materials are helping in a thousand and one ways.—W.

* * *

To meet world-wide climatic conditions in fighting a global war, ordnance parts must be protected from rust with the best varnish or paint available. Even such protection is inadequate, unless the metal surface, on which these protective coatings are applied, is clean chemically as well as mechanically.—A. C. P. Co.

Beauty always Attracts

The finish of a product can be attention-compelling in addition to serving as a protective coating. Our Creative Studio conceives artistic finishing schemes to provide eye-appeal. Our laboratory sees to it that the finishes so conceived are practical to apply and efficient in protective qualities. For both civilian and war products Rockford Finishes are fulfilling the most rigid requirements.

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Manufacturers of Protective and Decorative Coatings

WHAT WE WORKED OUT TO KEEP OUR *Finish Conveyor Clean*

BY H. W. CHESTER

EVERY foreman finisher who operates a conveyorized finishing department has quite a problem on his hands in keeping this equipment clean. The chain, hangers, etc., must be kept clean if the foreman expects to get a clean job of finishing. Dirt and dust that are allowed to collect on the chain, hangers, wheels, etc., will fall on the products being painted or finished and cause many rejects, which means added expense for finishing.

We have a completely conveyorized finishing department, with an overhead conveyor and its hanging trays making the rounds of all work stations and passing through spray booths and drying ovens. For some time we realized that it was costing us too much to keep our conveyor and its accessories clean. I believe that this problem of keeping finishing room conveyor equipment clean is one that interests many others who read this magazine, and I hope that what we have worked out will be of value to them. Perhaps some of you foremen have worked out something better. If so, or if you know of anything better, I would appreciate hearing from you.

Cleaning the Overhead Chain

About twice a month we give the conveyor chain an extra thorough cleaning. It is cleaned while in motion. A man stationed at a convenient place where the chain is empty, before it is loaded in the cabinet room, uses an air duster and long-handle brush. He brushes all dirt loose from the chain with one hand and then blows it off with the air duster which he holds in his other hand.

At a station a little farther along we have an ordinary spray gun mounted in position alongside the chain. Supplying this spray gun is a 5-gallon container of thin oil positioned to release its contents by gravity feed. With this set-up we spray a fine mist of oil on the chain. This keeps all joints and bearings oiled and it prevents spray mist from the varnishes, sealer, etc., from sticking to the chain. We repeat this oil-spraying operation once each week, as we are now operating two shifts. During this operation the spray gun that sprays oil, is set to operate automatically.

How We Keep the Trays and Hangers Clean

To keep the conveyor hangers and trays clean, we use the following method: Starting out with clean hangers we apply a heavy coat of detergent (same type of material as is used for painting insides of spray booths). This coating will prevent finishing materials from adhering to the conveyor hangers. Every finisher knows that if finishing materials

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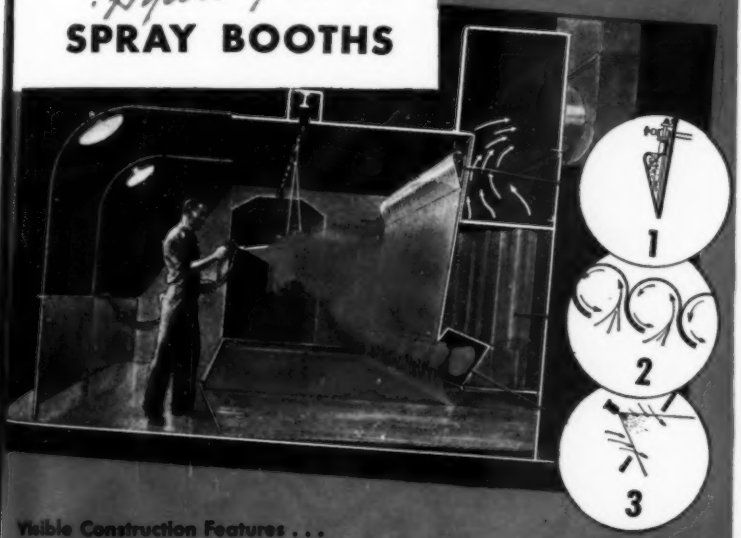

Visible Construction Features . . .

1. Adjustable reservoir construction of gutter above flood sheet insures an even flow of water over sheet, keeping entire surface clean.
2. Centrifugal eliminators separate all water from air stream. Clean air only is whirled upward to exhaust. Water drops to sludge tank below.
3. Visible high-pressure, cone-shaped water sprays, projected through circular orifices, thoroughly wash pigment from air stream—provide an effective seal against passage of fire.

Adaptable to
ANY PLANT or ANY PRODUCT

No matter how large or how small your plant or product may be, the Mahon Hydro-Filter Spray Booth can be adapted to your particular conditions. Mahon engineers design each installation precisely for each specific purpose. They will cooperate in the laying out of your entire spray painting production system.

THE R. C. **MAHON** COMPANY
DETROIT CHICAGO

Designers and Manufacturers of Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Systems, Hydro-Foam Dust Collectors and Many Other Units of Special Production Equipment—including Complete Finishing Systems.

"Our conveyor is like this one, but we have added a wooden tray at the bottom, and a wooden cover at the top, of each hanger."

are allowed to accumulate on bare metal or wood, the coating is very difficult to remove, especially from the metal bars on the conveyor hangers. A man, stationed at a convenient place along the conveyor line, applies this coat of detergent. He puts it on with a large brush as the conveyor travels past. The detergent should be made into a heavy paste form, using just enough water to bring it to the proper consistency.

When the hangers need cleaning again (about once a month, depending on the number of hours the conveyor is used, and the quantity of material sprayed each day, etc.), we station a man along the conveyor and have him tap the metal hangers sharply with a short piece of rod iron or iron pipe, as the chain moves past him. This causes the dry detergent to come loose and drop off in large chunks, bringing accumulations of finishing material with it. After each cleaning, we apply another coat of detergent to the hangers. Note: If no detergent has been used, it may be necessary to clean the hangers with scrapers before applying a detergent for the first time.

Our conveyor trays have wooden platforms over the metal parts. To keep these clean we use the following method: When the platforms were new we covered them with heavy felt paper, using thumb tacks to fasten the edges of the paper after it had been folded over the edges of the wooden platforms. When accumulations of finishing material need to be removed from the platforms, all that is necessary is to station two men along the conveyor to remove the dirty paper from the platforms and put on new paper. This they can do as the chain moves by at normal speed.

Removable Covers Over Trays

To prevent dirt from falling from the moving wheels of the conveyor onto the furniture or other products being finished, we have made and are using wooden covers

WAR PAINT!

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If you are one of the many manufacturers of ordnance now changing to AXS-946 primer, you'll find it here at Ferro. We're already in quantity production and making shipments daily.

This excellent rust-inhibiting primer is reduceable with *non-priority* solvents. Write or wire us for full details and prices.

LIQUID PLASTICS DIVISION
FERRO ENAMEL CORPORATION
CLEVELAND, OHIO

each of which measures 18x36-in. We fasten one of these covers over each hanger. The covers are fastened so that they can be removed by pulling out one metal pin which supports them. This makes them so simple to remove that a man can remove them as they pass his work station, if necessary. Of course, we never remove these covers unless we have some special size furniture (as some plants are making today) which is so tall that we cannot spray the tops with the covers in position.

At a convenient point, we also have two stiff-bristle brushes fastened opposite each other so that they bear against the sides of the conveyor chain. These brushes are fastened to adjustable spring brackets and are adjusted so that they clean some of the dust from the moving chain as it passes between them.

How often it is necessary to thoroughly clean a conveyor system depends on the number of hours it is operated each day, the number of spray booths it travels through, and the type of materials that are sprayed. As every finisher knows, varnish and paint cause greater accumulations of waste materials than do lacquers and lacquer-type materials.

Silicate Sealer for Paper

A LIGHT application of silicate to chip board or manila stock is effective in preventing loss of fragrant oils from such sensitive foodstuffs as coffee, chocolate and spices. It is also useful for protecting cartons designed to hold butter, lard, pressed meats, crackers and cookies. Even containers for peanut butter, ice cream, pickles or oysters may be safely and effectively lined with silicate.

The application of the protective film is best accomplished by the use of a standard coating machine. Either "N" or "S" Brand [of silicate] suitably diluted, is used. The paper, in sheets or in rolls, passes through a set of steel or hard rubber cylinders, the lower one of which revolves in a pan of silicate. The top cylinder serves as a pressure device to squeeze out the excess material.

From the silicate applicator the paper passes through a drying tunnel, heated by hot plates, and then to the rewinder of sheet pile. The silicate films so applied are resistant to dampness as well as to grease, but where actual water resistance is desired the dried sheet goes over a paraffin coater for a similar light application.

Paper may be coated with silicate in this manner at a high speed—100-ft. per minute is not uncommon. Normally the silicate is used at such a dilution that it strikes into the paper and does not remain as a surface film. Where a varnish-like coating is desired it may be accomplished by using a more concentrated silicate. In such cases the film is usually very brittle but it may be softened a little by adding suitable humectants. Honey, sugar or corn syrup are effectve in amounts of 10% or more. Glycerine, in smaller amounts is also useful. The polyhydric alcohols are serviceable in some instances.

The field of grease-proof linings is not limited to food containers. Some very attractive paper boxes lined with a silicate combination, are designed to hold pomades, face cream and other toiletries.—SILICATE P's & Q's.

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Materials Supplies Equipment

Thor No. 17 Spray Gun

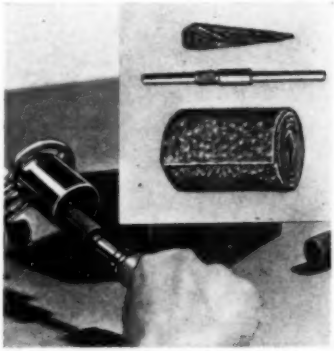
To overcome the difficulty experienced in securing aluminum and other wartime materials, which have been holding up the production of the popular Thor No. 7 and No. 2 Spray Gun Models, the Binks Mfg. Co., Chicago, Ill., is now producing the new Thor No. 17 gun, for quick deliveries in wartime.

This new Thor No. 17 gun, while not possessing the elaborate finish of the Thor No. 7, gives equal performance and is a thoroughly dependable substitute for either the Thor No. 7 or No. 2 spray gun. It is recommended as an ideal general purpose "wartime" spray gun. It does the work of its predecessors efficiently, and can be used in all places and for all work heretofore performed by the No. 7 and the No. 2 models. It can be secured for efficient spray painting and finishing without undue delay.

A wartime replacement spray gun.

Flex-Abrasive Wheels and Micro-Points

The Flex-Abrasive Co., 100 N. La Salle St., Chicago, Ill., announces a new line of abrasive wheels and points (with patented construction features) that place a fresh abrasive surface constantly in contact with the work and allow full use of the spiral roll, down to its final layers. These sharp, cool and smooth-running abrasive wheels and micro-points can easily deburr exterior edges and smooth up irregular surfaces which, ordinarily are hard to reach — such as holes, openings and corners. They are made in many different types and sizes for use on hard alloy steels, wood, rubber, resin and plastics.



Reaches into small places.

Mandrels are of tapered thread construction which firmly locks the abrasive wheel or point to the shaft

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by its rotary motion. An inexperienced operator can instantly remove or replace the wheel or point from mandrel without use of tools, nuts, split shafts or grommets. Samples and catalog can be obtained free of charge by writing the manufacturer.

Increases Luminosity of Luminous Painted Surfaces

A patent (No. 2318089) for increasing the luminescence of luminous and fluorescent painted surfaces, by the use of pearl essence lacquer under or back of the luminous or fluorescent paint coating, has been granted to Harry E. Mattin, assignor to The Mearl Corp., New York, N. Y. Quoting a paragraph of the patent paper:

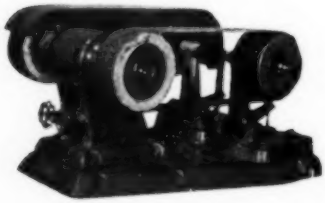
"A prime object of the invention is to enhance the phenomena of fluorescence and phosphorescence, so as to increase the brilliance and useful duration of illumination given off by fluorescing and phosphorescing materials."

One needs to read the three pages of the patent papers and illustrations accompanying same to realize and appreciate the merits and possibilities of Mr. Mattin's invention.

Bench Grinder-Sander

The new Jones Bench Grinder-Sanding and Polishing Machine No. 135 has been added to the line of abrasive-belt grinding equipment manufactured by Jones Engineering Co., Ellwood City, Penn. It fits on any shop bench—finding unlimited use for all burring, grinding and smoothing work. Using endless abrasive belts, it replaces small grinding wheels and troublesome hand-coated abrasive polishing wheels. The unit is adaptable to any type of grinding and smoothing, from flat pieces to irregular-shaped parts.

The grinder may be used with any ¾ to 2-hp. motor. Since the motor is mounted underneath the bench, away from dust and dirt, an enclosed type of motor is not necessary. Model No. 135 is equipped with a patented, cushioned, segment-face contact wheel; uses sharp, fast-cutting, factory-coated abrasive belts.



For burring and smoothing jobs.

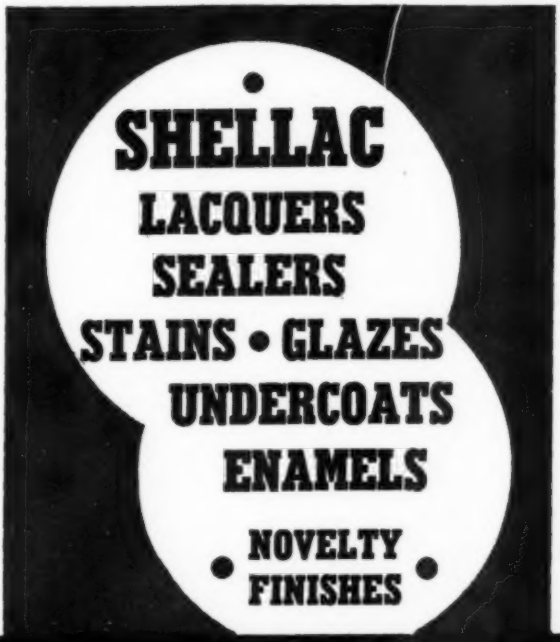
Waterproof Stopper

A quick-setting, permanent waterproof material has been developed to seal openings in masonry walls and floors. The name of this new product is "Stop-It." It is excellent for repairing below-ground surfaces that are seeping water; for repairing cracks in walls and floors; and for filling in where the floor meets the wall; also for building up broken and crumbled areas in the concrete walls; and for filling in around pipes and bolts.

It is also suggested for repointing and repairing brick or other masonry surfaces. Stop-It is used also for anchoring bolts, machinery and equipment. The repairs are permanent and weatherproof. This repair material is supplied in powder form and is made ready for use by the addition of water. The manufacturer is Tamms Silica Co., Chicago, Ill.

Dust Prevention With New Floor Treatment

A new stainless, transparent chemical floor treatment in liquid form called "Westone" is being used with satisfactory results on wood, cement, marble, tile, terrazzo, and certain other types of floors. It helps prevent floor wear, improves their appearance



IN STEP WITH THE TIMES

Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

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JAMES B. DAY & CO., CHICAGO

and, in addition, has a third and unusual value. Floors treated with Westone have a peculiar affinity for dust, consequently dust from floor traffic, which is often the chief cause of dust in the air, is prevented. This product is easily applied by spraying or mopping, and the floor is then maintained by sweeping it regularly with a yarn brush. Literature describing Westone may be obtained by writing to the West Disinfecting Co., 42-16 West St., Long Island City, N.Y.

Cleans Aircraft Engine in One Operation

Development of a new cabinet-type cleaning machine to simplify and speed the movement of aircraft engines on the production line, is announced by the Howard Engineering and Mfg. Co., 1044 Hulbert St., Cincinnati, Ohio. This new machine, the manufacturer states, is designed to conserve vitally needed man-power by reducing manual operations to a minimum.

Uniform and continuous cleaning is obtained by the use of a turntable designed to hold the engine and its assembly stand as it comes off the production line. This turntable revolves at 4 to 6-r.p.m. to produce complete wash, rinse and drying operations on one engine in about 20 minutes.

Wash and rinse solutions are both applied through one set of spray pipes which extend completely around the engine and its stand. First wash water, then rinse water, is pumped on the engine parts, after which heated, high-velocity air is ejected through the blow-off nozzle, to effectively dry excess water from the engine surfaces.

This machine can be designed to accommodate any size engine and stand. It is also well-suited to airfield use—on teardowns and assembly of engines, and to wash smaller, separate parts in baskets placed on the turntable. For further information, write the manufacturer.

Cadet Creme for Workers' Hands

According to a letter from Cadet Creme Co., 151 Farrar Ave., Worcester, Mass., Cadet Creme is in successful use in many of the large industrial plants throughout America,

where it is doing an excellent job in the prevention of industrial dermatitis.

Possessing a non-conducting loading factor, it keeps the temperature of the skin down, and while not retarding perspiration, absorbs the sweat, thereby preventing metal corrosion on highly finished parts.

For Treating Industrial Burns

According to "Accident Facts of 1942" published by the National Safety Council, Chicago, approximately 4½% of the industrial accidents known to the council were accounted for by burns and scalds.

As a means of reducing man hour loss from industrial burns, The Gebauer Chemical Co., Cleveland, Ohio, has prepared a stable, tannic acid solution which is marketed under the name of Gebauer's Tannic Spray. The bottle is unique in that its closure is an automatic device which permits the spraying of the solution directly from the bottle over the affected burn area.

The manufacturer makes special emphasis of the fact that the first five minutes are the most important in the treatment of burns and that if first and second degree burns are treated promptly, within a few minutes after they have occurred, with any good, recognized medicament, the

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Uniform, dull, wrinkle effect. Superior to old type wrinkles in both application and appearance. Usual baking schedules.

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Chicago, Illinois

probability of blister formation, infection and other complications is materially reduced.

The manufacturer further claims that this tannic spray solution is stable, antiseptic and that it forms a tannic film over the area to which it is applied.

Cleans Small Parts

L & R Mfg. Co., 54 Clinton St., Newark, N. J., has brought out another model precision cleaning machine for quickly cleaning and drying small metal parts, etc. Chief features include:

1) Air-cooled fractional hp. motor;

2) Small work basket, plus nesting basket subdivided into three compartments;

3) Variable action of the basket in solutions. By snapping on the thermostatic switch, a surging centrifugal motion of the basket is produced with speeds varying from high to low. More effective agitation follows with a resulting higher percentage of acceptable clean parts.

Dull, greasy, oil-stained units emerge from the machine clean and bone dry, ready for coating or assembly.

This new cleaning machine was developed as a result of experience in the field of electronics, and in response to specific requests from leaders in the industry. Initial tests demonstrated that the L & R principle of cleaning was adaptable to problems in the production of electronic tubes.

Cleans small parts quickly.

Beautiful Wood Grain; Photo Lacquer Veneer

Like other industries faced with wartime restrictions, the furniture field has found alternate non-critical materials that hold promise of permanent advantage, not only in appearance but in reduced manufacturing costs. Citing as an example the rapid popularity growth of its Sans-Arb photo-lacquer veneer, The Meyercord Co., Chicago, Ill., points out that the sales appeal and styling possibilities of these rare wood grain re-creations have been a source of astonishment to the entire retail furniture business.

A supply of domestic and foreign wood grain reproductions is available. According to the company, "Any grain desired can be obtained with Sans-Arb. Patterns are available for all-over finish, banding or trim. By means of the photo-lacquer veneer process, the original colorings and character of fine burls, crotches and straight grains are reproduced with utmost fidelity." From the cost standpoint, each sheet of Sans-Arb is said to represent many hours of finishing work.

Recognition of the amazing beauty and utility of the product is indicated by the mounting increase in sales throughout the furniture industry. Photo-lacquer veneers are now being applied not only to wood products but to metal, glass and plastics. They are claimed to be as durable as any wood finish, and can be applied quickly.

We're Saving up to 95% in Drying Time with BIRDSEYE INFRA-RED

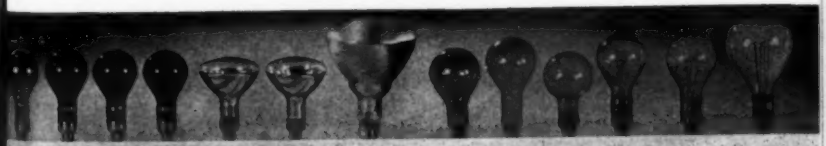
Drying, baking and dehydrating time now cut from hours to minutes in many war plants

SENSATIONAL SAVINGS in finishing time are now being made by the Infra-Red method. Rays from Birdseye Infra-Red Heat Lamps penetrate deep down into paints, enamels and lacquers and start baking instantly from the inside out. Longer lasting, more uniform finishes are obtained in *minutes* instead of the hours required by former baking methods.

After exhaustive tests in use, tunnels and banks of Birdseye Infra-Red Heat Lamps have replaced old-fashioned drying ovens in such busy war plants as Allis-Chalmers, Bulldog Electric, Curtiss-Wright, Dow Chemical, Willys-Overland and Square D, and are doing the work faster, better, more easily and at less cost.

All Birdseye tungsten-filament Infra-Red Heat Lamps have the economical 6000-hour average life. For complete information on Infra-Red, write today for Booklet N-7.

BIRDSEYE INFRA-RED HEAT LAMPS



WABASH APPLIANCE CORPORATION

345 CARROLL STREET, BROOKLYN, N. Y.

Manufacturers of Wabash Photolamps and Superlite Light Conditioning Bulbs

New Bomb Finish

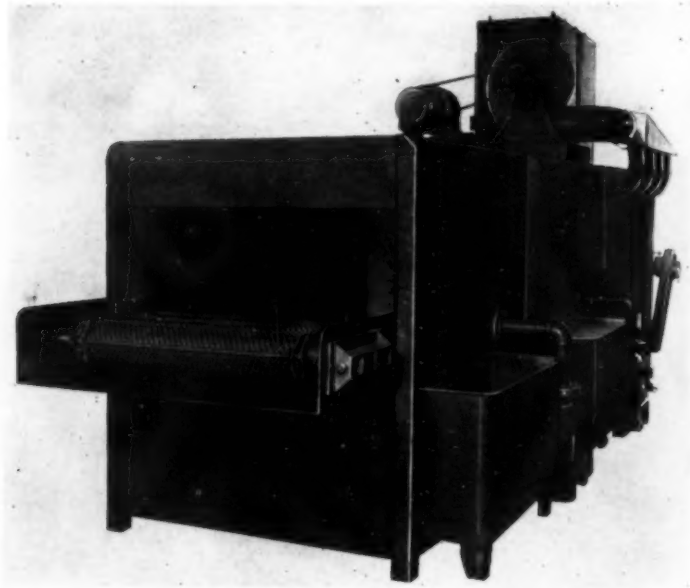
The Zapon Division, Atlas Powder Co., Stamford, Conn., announces that it has perfected Zapon S-631, a new bomb finish that meets U. S. Army ordnance specification No. AXS-946. The new formulation was especially developed to meet the mandatory requirements for finishing bombs and heavy ammunition which became effective July 1, 1943. The company's announcement states that the product is now ready for this important job.

Improved Cleaning Machine For Airplane Castings

Somewhat similar to the Alvey-Ferguson standard-type equipment for cleaning small metal parts, this Alvey-Ferguson metal products cleaning machine (illustrated here) was especially constructed to speed-wash, rinse and dry miscellaneous airplane castings up to 17x36-in. in size with high-speed efficiency.

It is equipped with a 36-in. wire-mesh conveyor and combination skim box, drain and overflow. The fan-shaped super-spray has a high co-efficiency of cutting action. The pumps and nozzles are protected by screen tanks with removable screens. Other features include parallel welded steam coils; unit model pump with no flexible couplings or sub-bases; marine-type clean-out and inspection doors, requiring no tools for operation; gear-head conveyor motor; shear-pin hub conveyor drives; spring loaded conveyor take-ups, and solution thermometer. Tanks and chambers are constructed entirely of ¼-in. plate.

For further details regarding this or other type cleaning or finishing equipment, write The Alvey-Ferguson Co., Dept. IF, 75 Disney St., Cincinnati, Ohio.



This metal-parts cleaning machine has merits of interest to production men.

NOT "MAGIC" JUST "KNOW HOW"

Pearl Harbor came with the suddenness of a tropical storm. But we were prepared. Years of laboratory and practical research in the field of industrial coatings had provided us with a solid foundation of experience in developing finishes with special characteristics. Hence we were able to take the war situation in our stride. Protective finishes, camouflage paints, reflective and non-reflective coatings, identification colors—all have been developed in our laboratories to meet Government specifications, under every shop condition and method of application. There is no magic about it—just "know how". Our laboratories are at your service for the solution of any finishing problem. Give us a call at our expense: Phone CEdar 8100 (Pittsburgh, Pa.).

WATSON-STANDARD CO.

Manufacturers of
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FINISHES AND LITHOGRAPH COATINGS

TOUGH JOB HEADQUARTERS

℞ Prescription Finishes

Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

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Questions and Answers

Plastic Paint That Navy Uses

Referring to J.W.D.'s question entitled, "What Plastic Paint Does the Navy Use?" as published in June 1943 issue, page 7, I do not know of any plastic paint that is being used in place of red lead. Zinc chromate is specified for priming steel ships, both interior and exterior.

The only hot application paints we use are as follows: A hot bituminous enamel is used in inaccessible places that are continuously wet and subjected to salt water, such as underneath anchor winches and chain locker compartments. The same applies to inaccessible engine foundations and various machinery foundations throughout the ship. This enamel is broken up and melted to a temperature of 400° F. When the temperature drops below 300° F., the enamel must be reheated.

We use hot plastic anti-corrosive and hot plastic anti-fouling paints. These are heated to 160° F. We also use cold plastic anti-corrosive and anti-fouling paints for ship bottoms. This, of course, is used to keep the barnacles and marine growth from forming during the fouling season. There is also a white plastic paint used in fresh water tanks which carry water for drinking, cooking, etc.

Red lead is now obsolete on navy vessels. Zinc chromate primer is used throughout, wherever priming is necessary.—HENRY NOVAK, Gen. Foreman of Painting, Shipbuilding Div., C. B. & I. Co.

How Lacquer Coatings Reveal Metal Tests

THE lacquer-held "footprints" of a bullet crashing into steel plate are giving scientists new information which may aid in the development of tougher armor and better armor-piercing shells for the nation's fighting men. The "footprints" are thin, closely spaced cracks which appear on a lacquer-coated steel target under the impact of a speeding bullet. Dr. Miklos Hetenyi is conducting the experiments in the Westinghouse Research Laboratories.

Some shots fired in the laboratory create a heart-shaped pattern extending 6-in. or 8-in. from the spot where the bullet hit or penetrated. In other tests the cracks form a series of circles around the bullet hole. Each tiny crack denotes stretching of the metal underneath the lacquer and gives a permanent picture of the strains that occurred at the instant of impact.

By spraying this smooth lacquer coating known as Stresscoat on metal parts and then contorting them until the brittle skin cracks, Dr. Hetenyi and other Westinghouse research engineers can also detect vulnerable spots in gears, shafts, valves and other parts of vital wartime equipment.

This lacquer coating test, Dr. Hetenyi said, is accelerating im-

Maybe there's a better answer to your finishing problem

● Since Pearl Harbor Glidden has not only added new achievements to its enviable record for solving finishing problems, but Glidden chemists, because of their research in fields of metallurgy, naval stores, soy bean derivatives and resins, have been able to develop a whole host of alternate finishes in place of formulas that contain war-scarce materials.

By these accomplishments, Glidden has enabled many manufacturers of war materiel to quickly meet government finishing specifications and to keep many manufacturers of civilian goods in production who otherwise might have been forced to close their doors.

All this new experience and Glidden's vast resources and nation-wide facilities (7 strategically-located laboratories) and a staff of industrial finishing experts are at your command—just write the Glidden office nearest you.

THE GLIDDEN COMPANY • National Headquarters • Cleveland, Ohio
Factories or Branches in Principal Cities

GLIDDEN

★ ★ *Everywhere on Everything* ★ ★

provements in motors, gears and various types of electrical machines because it enables research engineers to locate strains quickly. Life tests are still necessary but the cracked coating process tells when engineers are on the right track in designing new parts.

Just as yawning crevices opened by an earthquake reveal faults deep underground, tiny fissures in the lacquer tell a story of the strains that machine parts experience. Cracks in glossy finish pick out the "Achilles heel" of an 8-ft. high 2-ton gearwheel, or bare the weak points of a flapper valve, a tenth-of-an ounce slice of steel that vibrates back and forth in air-cooling machinery.

In one test Research Engineers William E. Young and John J. Gertz put the lacquer coating on a 1600-pound "model" of a gear tooth and squeezed the tooth in a large hydraulic press to locate accurately the stresses. Results of their work were turned over to the Nuttall Gearing Works of Westinghouse which is manufacturing gears for submarines, subchasers and other war equipment.

Lacquer sprayed on a gear tooth dries in 15 hours to form a tightly clinging skin about as thick as the diameter of a human hair. To determine the slightest strain that will crack this coating, a foot-long steel bar is sprayed at the same time as the gear tooth and under the same atmospheric conditions.

The steel bar is bent in a machine that holds it rigid at one end and depresses it at the other. Most of the cracks in the coating appear at the rigidly-held end and become less frequent until there are none at the end which was pushed down. Then the bar is placed beside a strain scale which is read opposite the point where the last crack occurred. This reading reveals, the minimum strain—that is, the least amount of metal must stretch to split the lacquer.

The coated gear tooth is then subjected to the same kind of punishment it would get when at work in a machine. It is slowly squeezed in a press capable of exerting a force of 400,000-lbs. while the laboratory workers scan the coating for the first appearance of a crack. With more pressure the "skin" splits in other places and finally the research men have a progressive list of the tooth's weak points.

A similar test was devised for flapper valves, the slivers of tough steel that quiver millions of times a week to regulate the flow of liquids and gases in refrigerators and air-conditioning machinery.—WESTINGHOUSE NEWS.

Avoid Unnecessary Noise and Accidents

IN SOME factories I have often noticed that men, bringing in a heavy box of parts to be finished, drop the box on the floor so that it makes a loud noise. With some, it is just a case of carelessness or lack of consideration for people at work; with others it is because they seem to take a delight in making as loud a noise as possible to startle workers whose attention is concentrated on their respective tasks. They do not stop to realize that a strange or unexpected noise, making an operator jump, is apt to cause accidents. Also, it may halt production temporarily. Why not put a stop to it?

Here is just one of many instances caused by startling someone: An important well-dressed visitor was accompanying the superintendent through the spray-

Adequate Protection

A manufacturer of communication equipment was unable to obtain the metal plating ordinarily used for a vital part and came to us with his problem. Our laboratory produced the answer in an organic finish, which stood up under the salt spray, humidity and other exacting tests to which the part was subjected. This is cited as an example of just one of many varied M&W services to manufacturers of war products. ☆ If it's a finishing problem, either in material or application, our engineers will gladly aid you in its solution. ☆ Send for booklet "Information on U. S. Government Specification Finishes." It contains an up-to-date list of government specifications and a description of the M&W finishes which meet them.

M&W

MAAS & WALDSTEIN COMPANY, NEWARK, N. J.

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES

BRANCH OFFICES AND WAREHOUSES: 1638 CARROLL AVE., CHICAGO, ILL. • 1228 W. PICO BLVD., LOS ANGELES, CALIF.

painting department of a war products factory. They paused a moment to watch a girl spraying articles at a spray booth. Suddenly, someone delivered a box of material nearby and slammed it down hard, making a loud noise. The girl, all absorbed in doing her best work with supreme grace of movement, was so startled that she jerked away from her work, whirled around with her fingers "frozen" to the gun trigger so the gun was spraying wide open, and let the full force of olive drab paint spray all over the visitor.

The superintendent would have been sprayed too, if he hadn't luckily stepped aside just a moment earlier. It was all done so quickly and timed so perfectly that one might have believed that it was diabolically planned to happen just that way. Naturally this unfortunate incident was highly embarrassing and uncomfortable for all concerned, especially to the victim whose clothes and fine appearance were, for the time being, completely ruined.—E. M. S.

Less than 20 years ago baking cycles of four or more hours were quite common. Compare this with the five and 10-minute bakes of today's practice.

Letters from I. F. Readers

(Continued from page 8)

tops at present in this matter: First, we grind down the chipped porcelain with a grinding wheel so that the surface and the edges of the chipped place are smooth. Then we fill this space in with a nationally known brand of pyroxylin putty. We let this set overnight to dry hard; then we sand smooth and level and then paint the spot with lacquer enamel.

If you know of any other procedure that would be better than the process just described, we would appreciate hearing from you.—C. N. Co. (Porcelain Breakfast Sets).

In a letter we are sending you the names and addresses of two other manufacturers of porcelain enamel repair. You might try these according to directions and decide for yourself which suits you best.—ED.

Ceramic Type Coating on Ferrous Metals

Recently we had a customer ask us for a unit to bake ceramic type coatings on ferrous metals and he stated that the temperatures involved would be between 700° and 750° F. I am wondering if you can tell me more about these finishes, who produces them, what type of equipment they are used on, and the like.—O. C. Co.

Perhaps you have in mind "Armor-Vit," which was briefly described under the title "Durable and Resistant Finish for Metal," in May 1943 issue of this magazine, page 66.—ED.

Air-Dry, Heat-Resistant Brush-on Paint

I am interested in an air-dry, brush-on paint of dark gray or black color—one that will withstand heat up to 550° F.—as applied to gas-fired cooking ovens in cooking ranges.—G. C. E.

Likes Wampler's Article

We have noted with considerable interest the article which appeared in your May and June issues, on the subject of "Undercoats in Finish Systems for Furniture." It is a good description of the functions of undercoats and lacquer sealers. Our glue people were particularly interested in the section with reference to adhesion of undercoats and the properties of the various materials which affect this adhesion.

It occurs to us there is also excel-

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OF

U. S. ARMY, NAVY and AIR FORCE

SPECIFICATION Finishes

Products Sheets • TESTOR CHEMICAL COMPANY, ROCKFORD, ILL., U.S.A.

These Products Sheets will be helpful to you, because they contain complete laboratory, production, and application details on a wide range of U. S. Army, Navy, and Air Force specification finishes which we are prepared to furnish you promptly and in any volume. Send for the entire file today. (Write on your business letterhead, please.) At the same time, request the illustrated folder which describes our modern production facilities. In addition to supplying standard specification materials, we will be happy to place our research laboratory at your service in the development of new and improved formulations to meet special finishing problems. You will find us . . . at all times and in all ways . . . a dependable source of supply!

TESTOR CHEMICAL COMPANY, ROCKFORD, ILLINOIS, U.S.A.

lent material for an article that stresses the importance of conserving lacquer and other finishing coats in wartime. We have some ideas along this line and will be glad to prepare a rough draft of such an article for your consideration. Would you like to receive such a draft?—X. Co.

Yes indeed, send it along.—ED.

Hot Lacquer Outfits

PLEASE SEND INFORMATION HOT LACQUER OUTFITS AVAILABLE IMMEDIATE DELIVERY. DO YOU THINK THEY MIGHT HELP OVERCOME HUMIDITY PROBLEMS.—W. & R.

We are sending you names and addresses of concerns that have supplied hot lacquer outfits. We question hot lacquer's ability to "help overcome humidity problems."—ED.

Rust-Proof Coating; Navy Finish, 300° F.

In the June issue of INDUSTRIAL FINISHING, on page 7, the article on "Rust-Proofing Steel Tubes"; we would be interested in learning whether the inquirer was able to secure the finish he desired. We would appreciate being advised also regarding the plastic paint the Navy is supposed to be using and applying at 300° F.—V. S. Co.

In Army Radio School

I was very happy to get the recent issue of I.F. . . . How is the war affecting your business and the finish business as a whole? I have been wondering about this.

Al Matlock who formerly wrote a few articles for Industrial Finishing.

I think that after the war I will try to go to work for some finish manufacturer in the laboratory. This kind of work has always appealed to me. I used to work with all kinds of paint samples, testing for durability, sunfastness, etc.

This radio business I am studying is pretty interesting. I am nearly halfway through the course now. The time sure flies when in training. (This course takes 108 days and there is no playing hooky either.) The penalty for being A.W.O.L. from class is seven days K.P., so I've managed to always be present so far. The hours are a little rough though, 2 A.M. to 10 A.M.

Saw a movie short recently which was made in the Consolidated works in San Diego, where I used to be. Boy did that make me homesick for the old paint shop!

I will probably go to gunnery school when I get through here, if I pass the physical, and be assigned to some bombardment group. This is a good job, it means an immediate sergeant's rating, and good pay too. If I don't get into this I will have to take whatever I can.—Pfc. Al Matlock.

Masking Discs

Some time ago you carried an advertisement on special masking tape discs. We would like to know the name of the company to contact for these discs. Could you give us the name of this advertiser?—B. E. Co.

You probably have in mind Kum Kleen Stickers, as supplied by Avery Adhesives, 451 E. 3rd St., Los Angeles, Calif.—ED.

Decals on Picture Frames

We have read with interest the article in June issue of INDUSTRIAL FINISHING by H. W. Chester, on "Lacquer Decals Replace Wood Veneers." We would appreciate any information you could give us on the use of decals on wood picture frames and molding. Also, where the necessary materials might be obtained.—M. & F. Co.

A decal manufacturer's ad is close to the end of the article you mention. We are referring your inquiry to them, as we feel sure they can promptly supply exactly the information and products you desire.—ED.

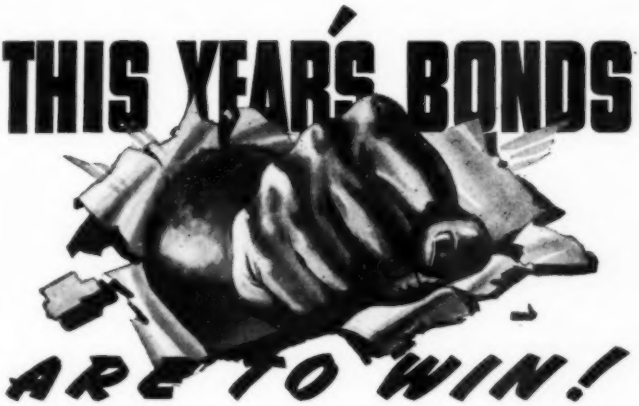
Bottle-Cap Enamel

Will you please send us the address of the S. Beverage Co.? We wish to contact them with reference to enamels to be used on reformed bottle caps.

We are furnishing several of the various breweries and large manufacturers of bottle caps with enamel to do this work. We have . . . just put out a product that bakes in one minute, and will satisfactorily stand pasteurizing and will permit adhesion of the cork disc.—Ault & Wiborg Corp.

LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS



ARE TO WIN!

★ Last year nearly 30,000,000 workers were buying War Bonds through 175,000 Pay-Roll Savings Plans. At an average rate of practically 10% of gross pay!

This year we've got to top *all* these figures—and top them handsomely!

"But," you say, "there's a Pay-Roll Savings Plan already running in my plant."

Sure, there is—but how long since you've done anything about it? Check up on it today. If it doesn't show substantially more than 10%, it needs a thorough re-canvass!

And you're the man to start it! Organize a vigorous drive. Other plants are boosting their quotas to 12% and 14% of pay-roll. You can do as well, or better.

In plant after plant, the Pay-Roll Savings Plan gives labor and management a common goal. Company spirit soars. Production swings up.

War Bonds help win the war, and close the inflationary gap. They keep on working when victory comes . . . build an invaluable reservoir of purchasing power to help American business re-establish itself. You help your nation, you help your workers, and you also help yourself. Get started today!

You've done your bit Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY

INDUSTRIAL FINISHING Magazine

Do Industrial Finishes Differ?

THEY most certainly do, as you may have found out. In the main they consist of about the same basic raw materials, usually purchased and supplied from the same recognized sources of supply. How these raw materials are combined to make lacquers, synthetics, primers or surfacers, and the mechanical equipment that does it, are generally the same.

The difference lies in the people who do it, what they know, what their experience has been, what problems they have encountered, how they solved them, and how their solutions have helped them in being better able to produce finishes that are easier to use, easier to handle, more accurate in color, more uniform in finish and more free from "bugs." That intangible is something which cannot be bought or sold. It must be experienced.—*From Lacquer & Chemical Corp. Bulletin.*

Ruthruff New Sherwin-Williams Research Director

The Sherwin-Williams Co., Cleveland, Ohio, announces the appointment of Dr. Robert F. Ruthruff as Director of Research for Sherwin-Williams and its allied companies.

Dr. Ruthruff, a graduate of the University of Michigan, as well as a former member of the teaching staff of that institution is widely known for his experimental and research work on various oils, gases, resins, and their by-products. Prior to joining the Sherwin-Williams organization in 1939 he was associated with other nationally known manufacturers.

Prior to his appointment as Research Director, Mr. Ruthruff has been in charge of oil research for The Sherwin-Williams Co. In this position he worked on both the development and production of raw materials from various petroleum fractions for the making of resins and synthetic drying oils.

In announcing Dr. Ruthruff's appointment, Dr. N. E. Van Stone, Sherwin-Williams' Vice-President and Director of Operators, stressed the company's growing dependence on both new types and new sources of raw materials. Tremendous advances in these materials have been made in the chemical and petroleum fields in the last few years. Even greater postwar advances are to be expected. In naming Dr. Ruthruff, Sherwin-Williams maintains its policy of selecting young men for key positions. He is 40 years of age.

Dr. R. F. Ruthruff becomes Director of Research for the Sherwin-Williams Co., Cleveland, Ohio.

This workman is examining cleaned steel cap nuts before dip coating them.

NOW AVAILABLE FOR WAR WORK

NEW HILO

RIP-PL FINISHES

with LINSEED OIL base

☞ These new Hilo RIP-PLS may be baked or air dried and will bake *harder* in *less time* than old type wrinkle finishes. Will also work in an open flame oven.

☞ May be baked hard in 30 minutes at 300° F., or in 4 hours at 150° F.; under infra-red lamps in 20 minutes at 260° F. They will air dry hard in 48 hours at 70° F.

☞ These new Hilo Linseed Oil Rip-pl Finishes are now available to war implement manufacturers.

WRITE TODAY *for samples and further details*

HILO

HILO VARNISH CORP. Established 1863

42-60 STEWART AVENUE BROOKLYN, N. Y.

CHICAGO: 2420 Washburne Ave. BOSTON: Park Square Bldg.

Booklets Catalogs Circulars

Ferbert-Schorndorfer Appoints New Salesman

The Ferbert-Schorndorfer Co., Cleveland, Ohio, has just recently appointed Edwin B. Hasseld of Indianapolis as its representative for the State of Indiana. Formerly connected with a large manufacturer of finishing materials, Mr. Hasseld is well qualified in the industrial paint field. He has had 18 years of experience with lacquers, enamels, wood finishing and other industrial paint materials.

Choosing Women for War-Industry Jobs

A 12-page bulletin under the above title, reveals some timely, practical and authoritative information on the subject. Copies are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. Price, 5 cents.

Flexible Hose Assemblies; Valves; Fittings

An 8-page catalog illustrates and briefly describes an extensive line of flexible hose assemblies, valves, fittings and accessories manufactured by The Weatherhead Co., 300 E. 131st St., Cleveland, Ohio.

The Traditions of Heraldry

Eagle Printing Ink Co., Division General Printing Ink Corp., 100 Sixth Ave., New York 13, N.Y., has issued the 12th folder in its Color Facts Series. This latest folder, titled The Traditions of Heraldry, contains useful data which will be of particular interest to those who have been called upon to choose colors for a crest or seal, or for the insignia of a school, club or association.

It is also interesting to note that although symbolic interpretations of color exist by the score and vary considerably among different religions and races, the definitions of heraldry are well established and represent about the most venerable list in the whole history and lore of color.

Copies of this folder are available upon written request.

Zinc Plated Steel

A small folder about zinc-plated steel sheets (up to 36x96-in. and in most gauges) gives interesting information about this line of products offered by American Nickeloid Co., Peru, Ill.

Cleaning Artillery Shell Cases

Three pieces of timely information about the cleaning of steel artillery shell cases, preparatory to painting, include a 4-page bulletin, a technical service data sheet, and a production flow sheet—all offered free by American Chemical Paint Co., Ambler, Penna. The information shows how Deoxidine No. 170 is used in connection with this important wartime work.

Army, Navy, Air Force Spec. Finishes

Testor Chemical Co., Rockford, Ill., announces a new file of Products Sheets of U. S. Army, Navy, and Air Force Specification Finishes. These data sheets, in standard-size file folder for convenient reference, contain complete laboratory, production, and application details on a wide range of aircraft finishes, ammunition lacquers and enamels, etc. They will be sent free of charge immediately upon request. Also available, is an illustrated file folder showing Testor laboratory and production facilities.

War Specification Products Booklet No. 3

Specification coating materials for 20 different branches of U. S. War and Government services are indexed, listed and properly described in a new book containing 48 pages 8½x11-in. Here is an authoritative reference book that should be in every manu-

facturing plant which now does or may expect to do product painting or finishing. Information in this book can be the means of saving much time and effort, as well as preventing many costly errors.

The book has an attractive heavy enameled paper cover distinctively laid out in mottled orange-red and solid jet black, plus a 2-in. spot of white to show the front of the Jones-Dabney laboratory. For a free copy of this remarkable book, write Jones-Dabney at Louisville, Ky., or one of its several branches.

Book of Finishing Knowledge

Finishine Laboratories, Inc., Syracuse, N. Y., announces publication of its new 200-page loose-leaf catalog and reference book. Contents include complete listings, sizes and specifications of all kinds of finishing materials and equipment. A complete section is devoted to upholstery supplies, general hardware and safety equipment.

Special features include an interesting and informative means of symbolization worked out by Mr. Hagadorn; elaborate and useful tables, color mixing chart, etc. The various colors and shades of the company's seven brands of Burning-in-Stix are shown with actual samples recessed into a heavy piece of paper board.

Manufacturers interested in receiving a copy of this catalog and reference book should write direct to Finishine Laboratories, Inc., Syracuse, N. Y.

Cleaning and Maintenance of Safety Equipment

From the standpoint of insuring greater protection to the worker, as well as extending their useful life, the care and maintenance of such safety devices as respirators, goggles, face and eye shields, welding helmets, rubber gloves, etc., are today receiving careful attention from safety-minded production executives. A new, 5-page Special Service Report, just issued by Oakite Products, Inc., 57 Thames St., New York, N. Y., gives timely, practical information on this subject. Copies of the book are free.

After pointing out the necessity for providing adequate facilities for maintaining personal safety equipment, the Report discusses the equipment and materials required for effectively carrying out such a program. The four essential steps in handling maintenance of respiratory and other equipment are described together with recommendations and instructions.

Since there is considerable variance in the design and construction of respirators and goggles, special care must be taken when cleaning sensitive metal and rubber parts. It is pointed out, for example, that strong alkalis should be avoided for cleaning aluminum and aluminum alloy parts of safety equipment. Rubber parts, because of their particular sensitivity to strong solvents, grease, oil, etc., should be cleaned with mild detergents.

Methods for care and maintenance of goggles, helmets and shields of both plastic and metallic construction, hose masks and rubber gloves are discussed. The Report cautions against the use of strong alkalis or solvents when cleaning fiber helmets with special varnish or lacquer finishes, for the reason that such materials may remove these protective coatings.

Colorful Oven Catalog

A 16-page catalog (8½x11-in.) printed in red, yellow and blue, illustrates and describes oven construction and shows many oven installations in various industries. Paint baking ovens are included. Names of typical users in the different industries are listed. For a free copy, write The Lanly Co., 750 Prospect Ave., Cleveland, Ohio.

Metal Cleaning Handbook

The Magnus Chemical Co., Inc., Garwood, N. J., has just issued a new 72-page illustrated manual, "The Metal Cleaning Handbook."

This new free book provides an organized means of selecting cleaning materials, methods of use and types of washing equipment best adapted to efficient cleaning of various kinds and shapes of metal articles.

The first half of the manual is devoted to cleaning materials and the factors governing the selection of such compounds. Each of the four main classes of cleaning materials (solvent cleaners, petroleum spirit cleaning, alkaline cleaners and emulsifiable cleaners) is discussed separately. Under each is indicated the kinds of metals and articles each class is best suited for, its major uses and its disadvantages.

The second section of the manual is a very complete treatise on modern metal-washing machines. It discusses all types, from simple dip tanks to fully automatic, continuous conveyor machines for washing, rinsing, drying, cooling and pickling operations. These machines, besides being described in the text, also are pictured in blueprint form. Several tables, charts and pictures complete the section.

The balance of the manual discusses related metal processing operations such as drawing, lubricating, burnishing, and anti-rusting.

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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Editorial

Logical Suggestions for Post-War Conversion

Editor's Note: In response to a request from one of our contributors, Mr. Pyke Johnson, one of the foremost leaders of the automotive industry, has outlined his views on the requirements necessary for successful industrial planning. Mr. Johnson, who was formerly president of the Automobile Manufacturers' Association—now reorganized as the Automotive Safety Foundation—is also chairman of the Trade Associations Division of Paul G. Hoffman's eminent Committee for Economic Development. Mr. Johnson's letter follows:

"Here are three requirements that seem to me indispensable to successful post-war industrial planning:

"1) Over the country the thousands of businesses, large and small, which are engaged in industrial production, must first do a pretty complete job of stock-taking—what is now being produced and for whom? How many men are employed? How quickly can the plant be converted to peacetime production and what can be produced? What will the sources of raw materials and labor be after the war? Where will the markets lie?

"On the basis of such a survey, each business should make as complete plans as possible for getting into peace-time production, tempering plans with an awareness of the plans of other producers in the same community and the same industry. Broadly, plans should look to the part which the producer can and will play in an economy of full production and employment, not too greatly reduced from that which the war has effected.

"2) There must be created a broadly favorable climate, an atmosphere in which industrial producers can now plan with confidence, and in which later plans will not fail to be activated solely because of uncertainty and lack of faith in the future.

"3) Supporting both this individual stock-taking and the creation of a healthful climate of

opinion, there should be a broad program of research, looking toward tapping the limitless vitality which can come from continuous improvement of industrial processes and new uses for raw materials.

"You may recognize these points as a part of the program of the Committee for Economic Development, on which I have been serving as Chairman of the Trade Associations Division." — *(Signed) Pyke Johnson, President, Automotive Safety Foundation.*

Mr. Foreman Finisher's Wartime Problems

★ The foreman finisher has always held a responsible position—one that required experience, sound judgment and foresight; but the present war has brought about conditions that have increased the foreman's responsibilities and multiplied his problems far beyond anything we ever expected. His labor problems have increased so much that he spends a great deal of his time in trying to solve them.

Until a few months ago a foreman could train new workers with a reasonable expectation that they would stay with him after they had been trained, and they did. But not so now. Most of the time they leave just as soon as they are trained; sometimes before. Naturally this involves a waste of time all around, plus a waste of employer's money.

★ Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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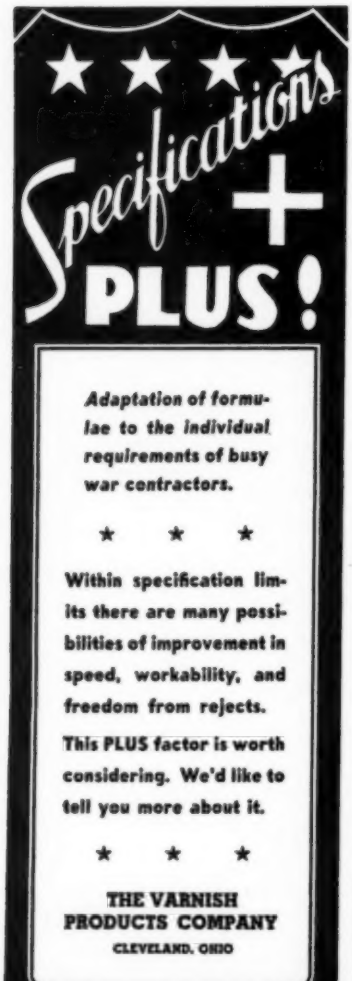
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Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.
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★ ★ ★
THE VARNISH PRODUCTS COMPANY
CLEVELAND, OHIO

In pre-war times the foreman finisher could hire experienced men, such as sprayers, but the shortage of labor due to the war has made experienced finishers almost unobtainable. As a result the foreman, pressed with new kinds of production problems, must take time out to train new men. He tries to teach a new man in a few hours, knowing quite well that the job should and does require several weeks of careful training in order that the workman can turn out the type and quality of work that we are accustomed to in peacetime.

In peacetime a foreman finisher could buy any type of finishing material to suit his needs, and he could expect his supplier to continue furnishing this same kind of materal so long as he needed it. But not so now. The scarcity and restrictions placed on raw materials (because of the war) forces finishing material manufacturers to change and reformulate their materials from time to time, so as to avoid using certain critical materials. This adds to the foreman finisher's problems; he has to work with these new materials until he can use them in his finishing schedule.

The shortage of certain raw materials has forced the foreman finisher to use a lot of wartime substitutes. In most cases, these do not work as well as the materials they replace, but it is up to the foreman finisher to make them work, for there is nothing else he can do if his company's factory is to continue operations.

There are a multitude of other problems which the wartime foreman finisher must solve. But, after all, perhaps our problems are no harder than those confronting our boys on the battle front, so it is

up to us here at home to do our part in carrying on, to help them win the war—H. W. CHESTER.

Random Comments on the Industrial Scene

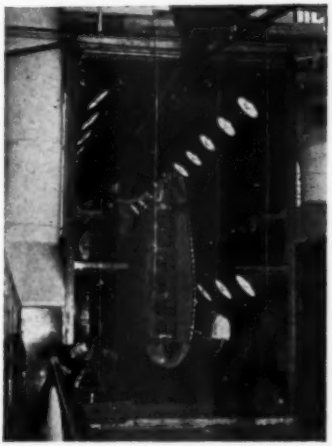
Letter From Sikorsky—Which industry is going to lead the post-war parade to our anticipated prosperity? Will it be automobiles again, or low-cost prefabricated housing, or television, or electronics? One man who has his own ideas on this fascinating subject is Igor Sikorsky, famed Engineering Manager of United Aircraft Corp.

He recently predicted a tremendous future for his helicopters, and stated that in ten years they will be sold for about the same price as a medium-range automobile. I have recently had the pleasure of conducting some personal correspondence with this distinguished aviation pioneer, and he has just written me as follows:

"Dear Mr. Singer: I would have no objection to your quoting me in your column in INDUSTRIAL FINISHING. You may say that I believe that, within a decade after the war, I expect to see hundreds of thousands of helicopters in the sky."

Skeptics may scoff at such talk. But anyone who saw the newsreel shots of one of Sikorsky's machines going through its paces recently on the plaza of the United States Capitol building, on the occasion of the 25th anniversary of the inauguration of airmail service, would be soberly impressed by the possibilities of this miraculous plane. It rose and descended vertically. It flew forward, backward, and sidewise. It stopped suddenly and hovered motionless in the air. One important New York

THE SPRAY BOOTH THAT BREATHES!



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The problem of painting these giant wings, quickly and safely, was put up to KOCH Engineers. They designed this huge down-draft waterwash unit which literally "breathes" . . . so that several spray guns can be operated at the same time, without danger from fumes or overspray. A positive exhaust system EXHALES paint-laden air into a water system that washes it free of solids . . . and INHALES a constant supply of fresh, filtered air. The results are greater safety and health protection . . . plus faster, steadier production.

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UNIFORMITY · QUALITY · PERFORMANCE
127 MAIDEN LANE
NEW YORK, N.Y.
FACTORY - RAHWAY, N.J.

real estate expert has said that helicopters will change the face of America in our time.

* * *

More Airplanes and Homes—Another important leader who has dared to offer a challenging concept of the world of tomorrow is Bror G. Dahlberg, president of the Celotex Corp. Addressing the annual meeting of the American Society of Planning Officials in New York recently, Mr. Dahlberg, too, envisioned sweeping changes that will be wrought by the wide use of helicopters, midget airplanes, and aerial busses after the war. He predicted that almost everyone will be able to own two homes, perhaps hundreds of miles apart. He envisioned an eventual 24-hour, 3-day work week, with the balance of the time available for recreation and relaxation. Mr. Dahlberg said that cities will vastly extend their limits, and whole municipalities will merge. He expects that mass production of homes will result in better, cheaper units. "Only two things limit our progress," was his blunt statement, "—lack of vision and laziness."

* * *

Color Ahead of Time?—A recent item in this column, predicting extensive post-war use of color in household appliances, has brought some mail. One correspondent writes that Norge experimented with colored finishes on appliances some years ago. Information has also been received to the effect that the Detroit Vapor Stove Division of the Borg-Warner Corp. successfully produced ranges in color, about six or seven years ago, as long as the demand lasted. Perhaps

these brave pioneers were merely ahead of the times!

* * *

Plywood Products—When one reads the amazing exploits of Britain's Mosquito bombers, it is pleasant to reflect that American industry played a vital part in the development of these revolutionary airplanes. It has been disclosed that the Pluswood Co., of Oshkosh, Wis., was responsible for producing the birch and maple veneers which become wings and fuselages of these potent destroyers. A new plywood has also been announced by this company; only half the weight of aluminum, it is stronger than many metals.

Dr. M. M. Wladaver, chief laboratory technician of the company, predicts unlimited possibilities for these woods in the post-war world —for window sills, bowling alleys, bars, table tops, ship deckings; even for store counters and fronts. The woods resist mild acids, fire, salt water and actinic rays of the sun. They are virtually scratch-proof, and can be sawed, drilled turned, threaded, milled and tapped like metals.

* * *

Fan Mail—Excerpt from a letter written by Professor Theodore Abel of Columbia University, and consultant to Victory Center, whose activities were described in this column in June: "We are very pleased that you have included a mention of the work of our organization in INDUSTRIAL FINISHING." As we pointed out, Victory Center, located at 745 Fifth Ave., New York, N. Y., is a non-profit organization which acts as a clearing house for ideas pertaining to winning the war.

* * *

More Guns and Ships—The U. S. is now manufacturing more ma-

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PAINT, VARNISH, AND LACQUER INDUSTRIES

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This NEW Crown gun gives high efficiency and speed in production work and maintenance and other painting and finishing jobs . . Uses time-tested Crown "20" Spray Head assemblies . . Full Spray Width, Material Adjustment . . Write for literature and prices.

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FOR WOOD
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Production!
WITH THIS NEW
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No. 94
RESPIRATOR

★ Full U. S. Bureau of Mines Approved (No. BM-2142) against Type A (Silica), Lead and Nuisance Dusts. Equip your workers with this new COMFORTABLE and SAFE Respirator for FASTER DEFENSE PRODUCTION. It's the "Cesco No. 94." Write.

Chicago Eye Shield Co.
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chine guns in one month than we turned out in all of World War I. Also in a 5-month period of 1943, we delivered 700 new cargo ships —nearly equal to the entire 1942 output!

* * *

Industry's Foremen — C. Donald Dallas, president of Revere Copper and Brass Inc., has kindly given his permission to quote from a speech he delivered in New York recently, before the National Council of Foremen's Clubs:

"Some day, the complete history of industry's part in winning the war will be written. A glowing chapter should be devoted to the contribution made by you foremen, and thousands of others like you scattered all over this country. You are the right hand of management. You must be upheld against anybody and anything that handicaps, makes more difficult or impossible, the proper discharge of your duties and responsibilities.

"The important part which you are playing, and will continue to play, in winning the war must be emphasized and re-emphasized. You were considered as sergeants, 'top-kicks,' if you please. I would like to promote you to the rank of Captains in the Army of Industry, in special recognition of the job you are doing in the war effort."

* * *

Swords Into Ploughshares—What is going to happen to the big airplane, shipbuilding and tank plants after the war? We can't vouch for all, but certainly quite a few are going to be converted to the mass production of housing units. Consolidated-Vultee Aircraft has already made some mention of its plans; and Henry J. Kaiser, miracle man of shipbuilding, has also announced his intention to enter

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NEW YORK WOODFINISHERS SUPPLY CO., INC.
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Established 1917

this field after the war. (Mr. Kaiser, incidentally, expects to build railway cars, too.)

With such enterprise and daring in motion, startling innovations in living patterns should await us.

* * *

Gazing Into Future—Here are some of the predictions for the world of tomorrow which were recently made by Dr. Karl T. Compton, world-famous physicist and president of the Massachusetts Institute of Technology, in an advertisement sponsored by Pan American Airways:

Aluminum or magnesium alloy automobiles, 20 years ahead of the 1942 models, which will give 35 or more miles to the gallon of gas.

Super cargo and luxury airplanes, which will economically reach every part of the world, on schedules as reliable as those for travel on land and sea.

Hundreds of new light materials, unknown outside of the laboratory ten years ago, which will revolutionize our lives. They should lift men as far above the Steel Age as the Steel Age lifted us above the Bronze—if not farther.

In medicine, conquest of the common cold and more dangerous diseases which, by early use of sulfa drugs and similar new medicines, may outweigh this war's loss of life many times over.

* * *

Publications Received—Several exciting pamphlets have arrived in the mail, which are to be commended to readers of this magazine. Consolidated Vultee Aircraft Corp. has issud an exciting 32-page booklet entitled: "Maps, and How to Understand Them." It again emphasizes the striking

Pantelleria—Lampedusa—Sicily? Sardinia?

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GUN STOCKS
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TOOL CHESTS
MARINE PARTITIONS
RADIO INDUSTRY, ETC.
SKIS
INSTRUMENT BOXES

FOR THE FIRST TIME in the history of modern warfare enemy territory has been reduced and captured by air assault alone. It was the splendid work of the USAAF under Generals Spaatz and Doolittle plus the RAF that accomplished this conquest from the air.

It was also the splendid work done by American engineers and production men who made the ships that are carrying out their work with great efficiency and deadly accuracy.

Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."

THERE'S NO TIME TO LOSE—THERE'S JUST TIME TO WIN!

THE LAWRENCE-McFADDEN CO.
Headquarters for Fine Finishes Since 1875
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theme that no spot on earth is farther than 60 hours' flying time from your local airport. Free copies may be obtained by writing to the company at P. O. Box 157, New York, N. Y.

And anybody interested in engines will find it worth his while to write to General Motors Corp. in Detroit, for a free copy of their new 80-page book: "Airplane Power." A striking sentence in the publication is a quotation from a speech by Lieutenant-General Brehon Somervell: "When Hitler hitched his chariot to an internal combustion engine, he ran it straight down our alley." — BY LAWRENCE H. SINGER.

A result of the restricted use of tung oil, due to the war, is a wrinkle finish made of linseed oil.

What An Industrial Finish Does

FUNDAMENTALLY, an industrial finish does three things. It decorates (or camouflages); it identifies, and it protects. The matter of decoration is one of color, combinations of color, design or finish formation. This, in itself, is quite simple to accomplish.

Identification also is primarily a matter of color. Protection is the feature that really matters. Resistance is the big word in industrial finishes.

Resistance to blushing, chipping, peeling, flaking, chalking, fading, cracking, lifting and becoming brittle. Resistance to heat, cold, light, stresses, strains, abrasion, acids, alkalies, oils, and the many destructive influences, natural and man-made which are constantly

striving, day and night, indoors and outdoors, on land, on the sea, under the sea, and in the air, to destroy those finishes.—*From Lacquer & Chemical Corp. Bulletin.*

Berry Brothers Receives "E" Award

Tuesday afternoon, June 22nd, saw the presentation of the Army-Navy "E" Award to the employes of Berry Brothers, Inc., Detroit, Mich., on the site of the original Berry Brothers plant, established by Joseph and Thomas Berry in 1858.

The ceremony was colorful and inspiring, bringing out many interesting facts regarding Berry Brothers history. Specifically, the award gave recognition to Berry Brothers outstanding performance in the production of aviation finishes, of which they are now one of America's leading manufacturers.

Presentation of the "E" Award Flag was made by Lt. Col. C. P. Quinn of the Sixth Service Command, U. S. Army.

The Lapel pin presentation was made by Lt. Comdr. H. S. Dilcher of the U. S. Navy.

Arthur Kiernan, Berry Brothers president, accepted the "E" Flag from Col. Quinn, and in his address of acceptance, pointed out many interesting facts regarding the early history of the company.

Industrial Fire Brigades Training Manual

This 184-page volume, recently published by the National Fire Protection Association, is designed to meet three widespread demands. First, as a training manual for employes assigned to carry out fire fighting duties under direction of the chief of the private brigade; second, as a reference book in those plants where a fire brigade is already organized, but where the experience of a large group of experts can be profitably used; and third, in those plants which need the essentials but not the details of large plant fire protection organization.

This book is divided into 16 chapters.

The text was prepared by the N. P. P. A. Committee on Firemen's Training, a group of leading fire chiefs and fire protection experts. It is profusely illustrated with drawings and photographs. Page size 8½ x 11-in. Single copies $1.50 postpaid from the National Fire Protection Association, 60 Batterymarch St., Boston, Mass.

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Patented Nozzle Reduces 25% Mist and Saves Paint

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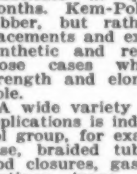
New Rubber Substitute Made in Paint Plant

A rubber-substitute that can be made in paint factories from vegetable oils and without use of critical materials is announced as suitable for foodjar rings, cements, stoppers, erasers, floor mats, tapes and other civilian and war products. Known as "Kem-Pol," it was developed by the Sherwin-Williams Co., Cleveland, Ohio, and is already being produced in carload lots in the company's Chicago plant.

The company's Chicago plant has been manufacturing the new rubber substitute in quantity for many months. Kem-Pols are not synthetic rubber, but rather substitutes, replacements and extenders for natural, synthetic and reclaimed rubbers in those cases where lower tensile strength and elongation are permissible.

A wide variety of war and civilian applications is indicated for the Kem-Pol group, for example, treads, mats, hose, braided tubing, pads, erasers, food closures, gaskets, felting, fabric coatings, tapes, sealing compounds, adhesives, stoppers and cements. Four different types of Kem-Pols are here.



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High grade Nitro Cellulose Lacquer made from the finest gum, cotton, solvents and color pigments. Suitable for spray use on wood or metal. Liberal quantities available in Olive Drab and other dark colors. Price greatly reduced. Write for full details.

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WANTED!

Executive or semi-executive position in industrial sales department. Experience: Several years actual field work and as assistant sales manager handling all types of sales department work, specializing on industrial production finishes. Address IF-938, care Industrial Finishing.

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Sales Engineer by old established manufacturer of complete line industrial synthetic enamels, lacquers, etc. Territory Eastern Pennsylvania. Salary and bonus. Write stating qualifications, age, etc. Our men know of this ad. Address IF-939, care Industrial Finishing.

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Manufacturer of Lacquers, Enamels, Synthetics, and Approved Government Specification Finishes has openings in the Metropolitan, New York and adjacent territories for men with experience in the Aircraft and Allied industries. Drawing account against commission. Address IF-941, care Industrial Finishing.

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"We have found your publication extremely valuable and helpful in connection with our finishing problems because of the excellent articles which it carries on this subject."—Chicago Apparatus Co.

"For some years past we have received your magazine INDUSTRIAL FINISHING. With its timely comments this magazine has been of much value to us."—Elliot & Co.

"I do not wish to miss a single copy of INDUSTRIAL FINISHING as I have been a constant reader of this magazine since the first copy, and it has always been very helpful in my work."—J. W. Russell.

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New Electric Portable Sander

Tough... Efficient... POWERFUL!

Smooth out operator jitters... and smooth out production problems at the same time —with the "Sterling 1000"... Power to spare, rapid cutting, yet its scientifically engineered, counterbalanced mechanism operates without trace of vibration! Built like a fine watch, but extra *sturdy* and *tough* for a thousand types of production.

Designed on New Sanding Action Principle!

Orbital, circular, thousands of abrasive grains cut furrows which cross and recross each other. With this action, the "Sterling 1000" cuts faster—produces the smoothest surface on wood, metal, plastic or composition. Ideal for many rubbing and polishing operations.

Write today for your copy of the New "Sterling 1000" folder, describing 21 important features *in detail.*

STERLING TOOL PRODUCTS COMPANY

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This town called HOME . . .

★ Remember that friendly lad who used to fill your gas tank and wipe your windshield at the corner filling station? And half dozen or a dozen other fine fellows who are not walking Main Street today, but instead are wearing uniforms in England, Ireland, Africa, Iceland, Australia, and in a hundred other corners of the world?

Don't think for a moment that they have forgotten the old home town, nor you. American boys are not like that. They are loyal and sentimental and proud of the town they came from, the people in it, and the things those people do.

They would give a lot to know today just what went on in the old home town last week or last month. You know, the sort of things you used to talk about together—the local election fight, the high school football prospects, the way the fish are biting, and such. A man's father, or mother, or girl doesn't write about those subjects.

That's where you come in. Why not sit down tonight and write a letter to one or two of these boys. Imagine their surprise and pleasure of hearing from you, of all people.

★

THE ADVANCE Paint organization has gone "all out" in backing up our boys on both the home front and the battle front . . . . and we're also backing them up with proper coatings for their implements of war.

★

ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA

AD-LEA-SIVE

IN BAR FORM*

Broadens the Use of LEA Compound for Burring, Polishing and Buffing

Makes the LEA Method of Finishing More Versatile

AD-LEA-SIVE is a special glue base sizing now available in bar form, making it easy and economical to apply to the wheel for forming a strongly adhering base for LEA Compound. Because several setting up operations can now be eliminated . . . because wheel life and production can be increased . . . because wheel inventories can be reduced . . . costs can be reduced! By virtue of this stronger base, LEA Compound, an excellent and already widely used cutting and polishing composition, can be applied to articles hitherto not suitable. Many more articles can now enjoy the economy and better finishing of the LEA Method.

Write for free sample bar of AD-LEA-SIVE and try it in your own operations. Directions for use are on the label.

*Patents pending

THE LEA MANUFACTURING CO.

Waterbury 86 Connecticut

Burring, Buffing and Polishing . . . Specialists in the Development of Production Methods and Compositions

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